

Summer and Pacific General Meeting and Air Transportation Conference



June 21-26, 1959

Headquarters
Olympic Hotel

SEATTLE, WASHINGTON

SCHEDULE OF EVENTS

June 21—SUNDAY

Registration Begins—1:00 P.M.
Informal Tea—3:00 P.M.

June 22—MONDAY

Technical Sessions—9:00 A.M.
Ladies' Coffee Hour—9:00 A.M.
General Session—2:00 P.M.
Ladies Color Lecture and Tea—
2:00 P.M.
P. T. & T. Co. Inspection Trip—
2:00 P.M.

June 23—TUESDAY

Ladies' Coffee Hour—9:00 A.M.
Technical Sessions—9:00 A.M.
Boeing Airplane Seattle Plant No. 2—
9:30 A.M.
Women's Auxiliary Group—10:00 A.M.
General Luncheon—12 NOON
Ladies' Sightseeing Tour—1:00 P.M.
Puget Sound Naval Shipyard Trip—
1:00 P.M.
Technical Sessions—2:00 P.M.
Theatre Party—8:00 P.M.
No-Host Dance—9:30 P.M.

June 24—WEDNESDAY

Skagit Hydroelectric Trip—6:45 A.M.
Ladies' Coffee Hour—9:00 A.M.
Technical Sessions—9:00 A.M.
General Luncheon—12:00 NOON
Ladies' Fashion Luncheon—
12:00 NOON
Aerial Cruise—Hydroelectric Plants—
12:30 P.M.
P. T. & T. Co. Trip—2:00 P.M.
Technical Sessions—2:00 P.M.
Scott Paper Mill Trip—4:30 P.M.
Sailboat Race—4:30 P.M.
Electrical Problems in Space—
7:30 P.M.

June 25—THURSDAY

Technical Sessions—9:00 A.M.
Ladies' Brunch—10:00 A.M.
Technical Sessions—2:00 P.M.
Kiana Potlatch Salmon Barbecue—
4:30 P.M.

June 26—FRIDAY

Skagit Hydroelectric Trip—6:45 A.M.
Weyerhaeuser Timber Co. Trip—
8:30 A.M.
Technical Sessions—9:00 A.M.
Ladies' Coffee Hour—9:00 A.M.
Boeing Airplane Renton Plant—
1:30 P. M.
Technical Sessions—2:00 P.M.



Mt. Rainier, Pacific Northwest's greatest peak.

The AIEE combined Summer and Pacific General Meeting will be held in the Olympic Hotel in the heart of downtown Seattle, June 21-26, 1959. The Air Transportation Conference with the theme, "Electricity in Space" will be an integral part of the Meeting.

The Seattle Section extends a hearty welcome to the members of the Institute and their guests. Seattle, located on beautiful Puget Sound, is the center of the Pacific Northwest and the gateway to Alaska and the Orient. Its setting, among mountains and waterways, provides many scenic trips and makes it an outstanding vacation land. A full and diversified technical program, together with a well-rounded schedule of field trips, ladies' entertainment, social and sports events, climaxed by a salmon barbecue, assures members and their families an interesting and pleasant meeting.

The weather in Seattle at this time of year is pleasantly cool. Warm clothing, including a light coat or sweater, is recommended for evening wear, particularly on boat trips. Sports clothes will be appropriate for the inspection trips and the salmon barbecue on Thursday evening.

HOTEL RESERVATIONS

Rooms have been reserved at downtown hotels and new, centrally-located motels for members and guests. Reservations should be made as soon as possible and should be received two weeks prior to the opening of the Meeting. If the hotels selected by you are not available, reservation will be made for you at a nearby hotel by the Seattle Hotel Association. Confirmation will be mailed to you directly by the Seattle Hotel Association. Every effort will be made to accommodate each request. Address requests to the AIEE Hotel Committee Chairman, Mr. D. E. Edwards, 1015 Third Avenue, Seattle 4, Washington. Advance reservation cards for this purpose are included with this mailed announcement.

The daily rates for rooms with private bath at the various hotels and motels are:

HOTELS	Blocks from Headquarters	Single	Two Persons		Suites
			Double Bed	Twin Bed	
Olympic Hotel	Hdqtrs.	8.00-15.00	11.00-18.00	14.00-20.00	35.00-45.00
New Washington	6	7.00-10.00	9.00-12.00	10.50-15.00	16.00-38.00
Roosevelt	4	7.00- 9.00	10.00-12.00	12.00-14.50	14.00-25.00
Mayflower	4	7.00- 8.00	9.00-10.00	11.00-12.00	20.00
Hungerford	1	6.00- 8.00	8.00-10.00	11.00-12.00	
Spring Apt.	1	8.50	10.50	12.50	
Earl	1	5.00	7.00	8.00- 9.00	
Windsor	1	7.00- 9.00	9.00-11.00	10.00-11.00	20.00-35.00
Camlin	6	10.00	13.00	12.00-14.00	20.00-25.00
Vance	7	6.50- 9.50	8.50-11.50	11.00-12.00	20.00
Stewart	6	6.00- 8.00	8.00-10.00	9.00-12.00	
Claremont	6	5.00- 7.00	6.00- 8.00	8.00- 9.00	
Exeter	3	7.00	9.00	11.00	
MOTELS					
City Center	12	5.50- 6.50	7.50- 8.00	8.75-10.00	11.00-16.00
Seattle Travelodge	9	6.50- 8.00	8.50-10.00	9.50-12.50	
Towne Center	7	8.78	8.78	9.82	
Towne Motel	8	8.00	9.50	10.00	

REGISTRATION

The registration desk located in the lobby of the Spanish Ballroom, Olympic Hotel, will be open at **1:00 p.m. Sunday afternoon** and from **9:00 a.m. to 5:00 p.m. daily** throughout the meeting.

Members should register in advance by returning the advance registration card sent with the mailed announcement. Registration fees are \$5.00 for members and \$8.00 for non-members, payable when you arrive. Student members and the immediate families of members will not be charged a registration fee.

Those registering are asked to indicate on the card the events in which they expect to participate in order to assist the Seattle Section in their plans for the various events. Tickets will not be held unless prepaid. Remaining tickets will be sold on a first-come, first-served basis.

GENERAL SESSION

The General Session will be held **Monday afternoon at 2:00 p.m.** and following a welcome from the Seattle Section, Mayor Gordon Clinton of Seattle will give an address of welcome. The business meeting to follow will include reports by the officers of the Institute and introduction of officers-elect. The Lamme medal will be presented jointly to P. L. Alger and Sterling Beckwith. Special recognition will be given the Student Prize Paper Award winners.

GENERAL LUNCHEONS

The **Tuesday** luncheon will provide special observance for the **75th Anniversary** of the Institute. The speaker will be J. H. Foote, President elect.

On **Wednesday**, Lysle A. Wood, Vice President and General Manager of the Pilotless Aircraft Division of Boeing Airplane Company will address the members on "The Role and Responsibility of the Skilled Engineer in Today's Industry with Particular Reference to his Managerial and Professional Responsibility as Contrasted to his Technical Ingenuity."

TECHNICAL SESSIONS

A well-rounded and interesting Technical Program will include over 60 technical sessions featuring more than 250 papers. Sessions are scheduled at 9:00 a.m. and 2:00 p.m., from Monday through Friday, except during the General Session, Monday afternoon. The Air Transportation Conference will constitute 10 of the sessions, with over 50 papers and is built around the theme of "Electricity in Space."

A special feature of the meeting will be an **aircraft discussion panel on Wednesday evening at 7:30 p.m.** The subject under discussion will be "Electrical Problems in Space, and E. C. Wells, Vice President and Manager of Systems Management, Boeing Airplane Company, will act as moderator. Panel members will include Dr. Winston H. Bostick, Stevens Institute of Technology; Dr. David C. White, Massachusetts Institute of Technology; Dr. Richard B. Kershner, Applied Physics Laboratory, John Hopkins University; and C. W. Burrell, Missile and Space Division, Lockheed Aircraft Corp.

WOMEN'S AUXILIARY GROUP MEETING

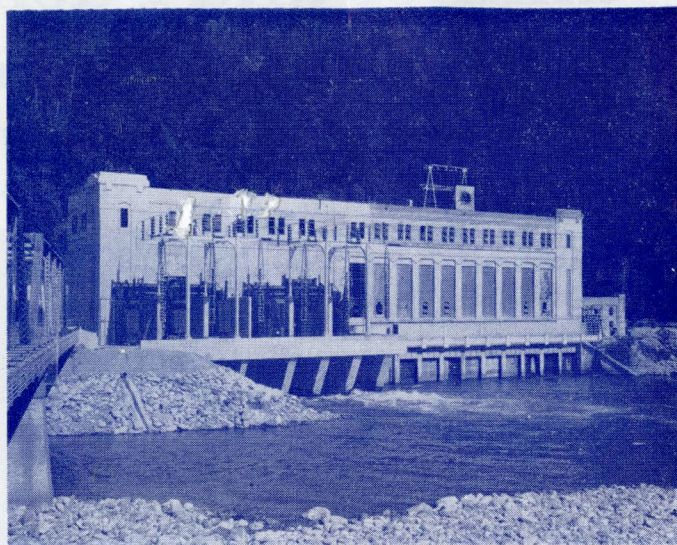
A Women's Auxiliary Group meeting will be held Tuesday morning at 10 a.m. in the ladies' hospitality room. Delegates from all sections having women's auxiliaries or that are interested in forming auxiliaries, are invited to attend.

SOCIAL ACTIVITIES

Kla-how-ya Kloshe Tillicum (Welcome, good friends)—Sunday afternoon in the Spanish Ballroom, Olympic Hotel, from 3:00 p.m. to 5:00 p.m. This is a get-together that will provide everyone an opportunity to meet the officers of the Institute and greet old friends. **Informal Dance**—A no-host informal dance will be held in the Olympic Bowl, Olympic Hotel, Tuesday evening, 9:30-12:00 M.

Theatre Party—Tuesday evening at 8:00 p.m. at the Penthouse Theatre. This unusual theatre of the School of Drama on the University of Washington campus is the first playhouse ever designed and built for the presentation of drawing-room plays in the circus style which originated here. The theatre has been reserved for AIEE members and guests that night. Tickets—\$1.25 each.

Kiana Potlatch Salmon Barbecue—Thursday afternoon and evening. The highlight of the social activities for the week will be a salmon barbecue held at Kiana Lodge on nearby Bainbridge Island. Arrangements have been made in the meeting schedule so that members may leave the Olympic Hotel by bus at 4:30 p.m. to board special boats for the trip to Kiana Lodge. The boat ride includes a trip through Lake Washington Ship Canal and the Government Locks, to the salt waters of Puget Sound. A one-hour boat ride across the Sound through Agate Pass will provide a beautiful scenic trip. Complimentary refreshments will be provided during the boat trip. At the Kiana Lodge an authentic potlatch salmon barbecue will be served, followed by an interesting program. Guests will return to the hotel at 11:00 p.m. This is an ideal event for members and their families and



Seattle City Light's Gorge power house.

one which will be long remembered. Tickets—Adults, \$10.00; Children under 12, \$5.00.

SPORTS

Sailboat Race—Wednesday afternoon. Seattle is noted as a boating center and sailboat races are held on Lake Washington throughout the summer months. The Senior Knockabout Club will hold their weekly sailboat race and arrangements have been made for a special AIEE race. Members desiring to participate will be assigned one to a boat, as crew members. Transportation will be provided leaving the Olympic Hotel at 4:30 p.m.

Salmon Fishing Trip—Salmon fishing at ocean resorts is generally good at this time of year. Because of the distance to these fishing places, a special derby is not possible, but tentative reservations have been made for charter boats at Westport, Washington, on the Pacific Ocean to accommodate a post-convention salmon fishing trip on Saturday. Westport is 140 miles from Seattle and fishermen will leave Seattle Friday evening—fishing early Saturday morning. Charter boat reservations are \$10.40 per person. Transportation, lodging and tackle are additional at nominal costs. In order to reserve the necessary boats, advance registration for this fishing trip must be received not later than June 15.

Golf—Arrangements at the various golf clubs will be made for those desiring to play golf, from Monday through Friday. Those wishing to play are asked to check at the Sports desk.

LADIES' ENTERTAINMENT

The Ladies' Entertainment Committee has planned a wide variety of events which will be appealing to all interests.

The ladies' hospitality and headquarters room will be open daily for social gatherings and bridge. Coffee will be served from 9:00 a.m. to 10:00 a.m. daily, except Thursday, and hostesses will be in attendance.

Color Lecture and Tea—2:00 p.m., Monday afternoon, Washington Athletic Club. Helen Zundell, color analyst, who will speak on "What is Your Personal Color Scheme?" uses models from the audience, depicting each color type, and demonstrating the individual's coordinated color scheme. Tickets—Complimentary.

Guided Sight-Seeing Tour and Tea—Tuesday afternoon. Buses will leave the Olympic Hotel at 1:00 p.m. The tour will provide an opportunity to see beautiful Seattle with its snow-capped mountain ranges, fresh water beaches, floating bridge, University of Washington campus, and several outstanding residential areas. They will be served tea at the Seattle Art Museum where the finest 17th and 18th century jade collection in the world, and renowned Cress collection of old masterpieces can be seen. Tickets—\$3.00.

Champagne Luncheon and Fashion Commentary—Wednesday noon at the Seattle Tennis Club. Buses will leave the Olympic Hotel at 12:00 noon. Bernice Caverly of Frederick and Nelson, Seattle's outstanding department store, will speak on "Advance Report of Fall Fashion, Designers and European Boutiques." Tickets—\$4.00.

Brunch and Flower Arrangement Demonstration—10:00 a.m., Thursday morning, Olympic Hotel. Crissey, one of Seattle's leading florists and outstanding in the flower arrangement field, will present a flower arrangement demonstration. Tickets—\$3.00.

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ADVANCE COPIES OF PAPERS

Members may obtain preprints of numbered papers at the uniform price of 40¢ each (80¢ 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 to those who wish to avoid remittance, by check or otherwise. The Transaction 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 COMMUNICATION AND ELECTRONICS.
- II APPLICATIONS AND INDUSTRY.
- III POWER APPARATUS AND SYSTEMS.

Monday, June 22

9:00 a.m.—Chemical Industry

CP.* An Arabo-Galactan Industry for the Pacific Northwest. M. Adams, State College of Washington.

CP.* Pozzolan Production at the Priest River Dam. E. N. Klemgard, State College of Washington; A. E. Strom, Grant County PUD.

59-820. Trends in Ground Bed Design for Cathodic protection of II Underground Structures. A. P. Landry and I. N. Howell, Southern Bell Tel. & Tel. Co.

59-505. Deep Ground Beds for Cathodic Protection. S. E. Trouard and E. A. Wagner, Jr., New Orleans Public Service, Inc.

59-821. Cathodic Protection Applications at the Hanford Works. II C. S. Bucholz, General Electric Co.

CP.* Theory and Practice of Paint Application. G. Martin, Parker Paint Mfg. Co., Inc.

9:00 a.m.—Insulated Conductors

59-496. A 35 KV Polyethylene Insulated Cable Installation. G. J. III Crowdes, Simplex Wire and Cable Co.

CP.* Operating Experience With Thermoplastic Insulated Wire and Cable in Chemical Plants—Progress Report No. 2. M. M. Gilbert, E. I. Dupont De Nemours and Co., Inc.

CP59-892. The Texada Island Submarine Cable Crossing. P. J. Croft, British Columbia Power Commission.

9:00 a.m.—Rotating Machinery

57-130. A New Stator Coil Transposition for Large Machines. W. L. III Ringland and L. T. Rosenberg, Allis-Chalmers Mfg. Co.

59-683. The Polyphase Induction Machine With Solid Iron Rotor. III N. Kesavamurthy and P. K. Rajagopalan, Indian Institute of Technology.

59-810. Constant Frequency A-C Power Using Variable Speed Generation. R. D. Jesse, Westinghouse Electric Corp.; W. J. Spaven, Walter Kidde & Co., Inc.

9:00 a.m.—Basic Sciences

59-917. Mixed Transcendental and Polynomial Transforms. O. J. M. I Smith, University of California.

CP59-918. The Analysis of Sampled-Data Systems With Non-Linear Elements. R. E. Andeen, Sperry Rand Corp.

CP.* Analysis of Pulse Duration Sampled-Data Systems With Linear Elements. R. E. Andeen, Sperry Rand Corp.

59-919. Recurrence Relations in the Solution of a Certain Class of I Nonlinear Systems. A. A. Wolf, University of Pennsylvania.

9:00 a.m.—Research

CP.* Graduate Study and Research in Electrical Engineering at the University of California. S. Silver and R. N. Saunders, University of California.

CP59-882. High-Voltage Research in a College Laboratory. L. N. Stone, Oregon State College.

CP59-936. Preliminary Design of Hydrological Data Telemetering Equipment. L. A. Beattie, G. G. Hespelt and L. M. Maxwell, University of Idaho.

CP59-884. An Aviation Hazard Light for Mid-Span Operation on Power Transmission Lines. H. J. Dana, Washington State Institute of Technology.

CP.* Electricity for Space Vehicles. V. Hart, Boeing Airplane Co.

9:00 a.m.—Safety

CP.* Hazard Control in Electrical Testing. J. V. Grimaldi, General Electric Co.

CP59-923. Electrical Safety Regulations in the United States, Canada and Europe. L. D. Price and H. P. Michener, National Electrical Manufacturers Association.

CP59-940. 120 Volt Three-Wire Receptacles and Their Attachment Plugs. C. F. Dalziel, University of California.

CP.* Mouth-to-Mouth Resuscitation (Film). A. Gordon, Children's Hospital, Los Angeles, California.

2:00 p.m.—Annual Meeting

1. Report of the Treasurer, C. H. Linder.

2. Report of the President and the Board of Directors, L. F. Hickernell.

3. Report of the Committee of Tellers on the vote for nominees for AIEE Officers.

4. a) Introduction of and presentation of President's Badge to J. H. Foote.

b) Response by Mr. Foote.

5. Presentation of the Lamme Medal to Sterling Beckwith and Philip L. Alger.

6. Other business.

8:00 p.m.—The Art of Aircraft Control

Panel Members: K. D. Johansen, Boeing Airplane Co.; E. Buxton, J. R. Moore, Autonetics Div. of N. American Aviation; W. Lundahl, Minneapolis-Honeywell.

Tuesday, June 23

9:00 a.m.—Domestic & Commercial Applications

CP.* The 1959 National Electrical Code. H. H. Watson, General Electric Co.

CP.* The Impact of Electric Heating on a Public Utility. D. H. Ohney, Washington Water Power Co.

CP.* A Control-Free Earth Heat Pump. R. A. Balch, Line Materials Industries.

CP.* Trials and Tribulations of a Heat Pump. K. M. Wood, Wood & Landerholm.

9:00 a.m.—Chemical Industry

CP.* The Pacific Northwest Chlorine-Caustic Industry. J. Judy, Hooker Chemical Corp.

CP.* New Products from the Forests. M. D. Strickler, State College of Washington.

59-822. High Speed Restarting and Protection of Large Synchronous II Motors. C. L. Phillips, General Electric Co. and M. H. Yuen, Bechtel Corp.

CP59-891. High Speed Reclosing of Circuit Breakers on Systems Utilizing Synchronous Motors. R. V. Shepherd and W. R. Morton, General Electric Co.

59-823. Battery Impedance: Farads, Milliohms, Microhenries. E. A. II Willihnganz and P. Rohner, C. & D. Batteries, Inc.

9:00 a.m.—Power Generation

59-880. Measurements of Hydraulic Turbine Windage and Friction III Losses. R. L. Krahn, U.S. Army Corps of Engineers.

59-819. Performance of Large Waterwheel Generator Pivoted Pad III Thrust Bearing Determined by Tests Under Normal Operating Conditions. R. A. Baudry, E. C. Kuhn and G. D. Cooper, Westinghouse Electric Corp.

59-881. Automatic Controls of Hydroelectric Stations of the B. C. III Electric Company Limited. S. R. Hayden, E. P. Ehmayr, H. A. Baumann and R. S. Moulds, B. C. Engineering Co., Ltd.

CP59-933. Electric Features of the Niagara Power Project. J. Saloma, Charles T. Main, Inc.

9:00 a.m.—Relays

CP59-796. System Swing Detector Relay. J. N. Haroian, Idaho Power Co.

59-775. An Automatic Trip-and-Carrier Test for Phase Comparison III Carrier Current Relays. R. W. Hirtler, The City of Los Angeles Dept. of Water and Power.

59-797. Special Circuits for Ground Relay Current Polarization from III Auto-Transformers Having Delta Tertiary. P. A. Oakes, Idaho Power Co.

CP59-798. Optimum System and Motor Protection Through Proper System Grounding and Relaying. R. W. Swarthout, General Electric Co.; R. C. Dickson, Phelps Dodge Copper Refining Corp.

9:00 a.m.—Rotating Machinery

59-684. Electronic Surge Testing of Universal Armatures With Null III Detection. H. R. Weed, Ohio State University.
 CP59-803. Amplitude Build-Up During Acceleration of Oscillatory Systems Possessing Several Degrees of Freedom. O. I. Elgerd, University of Florida.

CP59-804. Cross Transformer Metadyne for Alternating Current. J. Ben Uri, Carnegie Institute of Technology.

9:00 a.m.—Radiation Effects Symposium I: Economic and Engineering Aspects of Nuclear Power

CP.* The Economic Utilization of Nuclear Power. H. Vann, Atomic Energy Commission.
 CP.* Some Control and Auxiliary Power Aspects of Nuclear Power Plants. A. R. Jones, Westinghouse Electric Corp.
 CP.* Radiation Effects Problems in Electronic Design. D. M. Newell and P. S. Miglicco, Convair.

9:00 a.m.—Section Delegates Conference

9:00 a.m.—Industrial and Commercial Power Systems

CP59-815. Electrical Distribution in British Industrial Plants. H. Clay, McLellan and Partners.
 CP59-816. Gas Turbine Drive For Industrial Power Generation. Z. S. Stys, Brown Boveri Corp.
 CP.* A New Approach to Commercial Building Power Distribution. C. F. Hanson, Pacific Telephone and Telegraph Co.

9:00 a.m.—Optimum Nonlinear Control

CP59-836. Switching Criteria For Certain Contactor Servomechanisms With Arbitrary Inputs. C. A. Anderson, Maxwell Air Force Base.
 CP59-837. Modified Optimum Nonlinear Control. T. Mitsumaki, Hitachi Central Research Lab.

59-838. A Practical Standard Transistorized Optimum Response II Controller. K. Chen, Westinghouse Electric Corp. and D. R. Little, Curtiss-Wright Corp.

CP59-839. Simulation of a Nonlinear Aircraft Maneuver Control System With a Combination of Analog and Digital Techniques. D. R. Clifford, Boeing Airplane Co.

CP59-840. Dual Mode Relay Servos. R. N. Buland, Aeronutronic Systems Inc. and N. Furumoto, University of California.

9:00 a.m.—Telemetering System Considerations

CP.* Real Time Flutter Analysis by FM/FM Telemetering. H. R. Darby and L. E. Nackley, Convair.
 CP.* Techniques for More Realistic Evaluation of Telemetering Pickups. R. O. Smith and Paul Lederer, National Bureau of Standards.
 CP.* A Linear Programming Technique for Increasing Telemetry Systems Reliability. S. Moglewer, Northrup Division.
 CP59-942. Digital Data Handling Techniques of Telemetering in Integrated Systems. L. K. Hedding, Union Switch and Signal.
 CP.* Telemetering Requirements for Inflight Environmental Measurements. M. R. Beckman, U. S. Naval Missile Center.

2:00 p.m.—Electric Heating in Schools, Churches, etc.

CP.* General Aspects of Electric Heating for School Rooms. W. G. Potter, Edward L. Weigand Co.
 CP59-926. Electric Heating for Schools. B. A. Travis, Beverly A. Travis & Asso.
 CP.* Electric Heating in Churches. L. N. Roberson, Roberson, Inc.
 CP59-927. Electric Floor Heating by Steel Grid Mesh System. G. E. Hutchcroft and H. P. Gluckman, Los Angeles Dept. of Water and Power.

2:00 p.m.—Power Generation

59-877. Power Plant Control Board Locations and Operation. E. G. III Norell, Sargent and Lundy.
 CP59-878. Minimum Recommended Protection For Unit-Connected Steam Stations. AIEE W.G. on Steam Station Protection of the Power Generation Committee, D. M. Sauter, Chairman.
 CP59-866. Automatic Power Control of a Seed and Blanket Power Reactor Plant Through Use of a Cyclic Device and Contactor Control System. R. Saucedo, Westinghouse Bettis Atomic Power Dept. and D. J. Ford, University of Pittsburgh.
 CP59-935. Report of Working Group on Hydraulic Governor Applications. G. J. Vencill, Union Electric Co.

2:00 p.m.—System Engineering, Substations and Relays

59-916. Integration of Brownlee Into the Idaho Power Company System. D. R. Russell, C. N. Teed, L. O. Evans and M. E. Byrne, Idaho Power Co.
 59-921. Design, Construction and Operation of Brownlee Hydroelectric Development. G. B. Soule, T. R. Heikes, W. B. Mitchell and O. E. Schaufelberger, Idaho Power Co.

59-806. Underfrequency Protection of Power Systems for System Relief Load Shedding—System Splitting. C. F. Dalziel, University of California and E. W. Steinback, Kaiser Engineers.

59-922. Design Features of Bulk Power Stations on the Southern California Edison Company System. O. R. Bulkley, Southern California Edison Co.

2:00 p.m.—Research Seminar

CP.* Fundamental Researches of Interest to Electrical Engineers. Moderator, L. N. Stone, University of Oregon.
 CP.* Descriptions of Research Facilities in the West. Moderator, H. A. Baldwin, University of Arizona.
 CP.* Research Areas in Electricity Still Inadequately Covered. Moderator, A. L. Betts, Washington State University.

2:00 p.m.—Computing Devices

CP.* Automatic Check-out—A Data Processing Problem. E. R. Woods, Convair.
 CP.* A 400 Channel Automatic Data Acquisition and Interpretation System (DAISY). S. Rogers, Convair.
 CP.* FOXY—A Solid State Analog Memory for Functions of Two Variables. P. C. Sheretz, L. J. Kamm, L. E. Steffin, Convair.
 CP.* Cathode Ray Oscilloscope Instrumentation for High Speed Digital Computer. L. C. Hedrick, Tektronix, Inc.

2:00 p.m.—Radiation Effects Symposium II: Effects of Radiation on Materials

CP.* Nature of Radiation. D. G. Maeder, Oak Ridge National Laboratory.
 CP.* Effects of Irradiation in Materials. D. K. Holmes, Oak Ridge National Laboratory.
 CP.* Effects of Radiation in Man. R. H. Ritchie, Oak Ridge National Laboratory.

2:00 p.m.—Section Delegates Conference

2:00 p.m.—Uses of Aluminum Conduit and Conductors in Industry

CP59-769. The Use of Aluminum Conduit in Industry. H. Esch, Kaiser Aluminum and Chemical Sales, Inc.
 CP.* The Use of Aluminum Conductors for Industrial Power Distribution at Kitimat. H. J. Kirkpatrick, Aluminum Company of Canada, Ltd.

2:00 p.m.—Control Systems

59-682. Input-Output Relationships for Multi-Sampled-Loop Systems. II G. C. Lendaris and E. I. Jury, University of California.
 59-828. Analysis of Nonlinear Sampled-Data Control Systems, Part II I. E. Kinnen and J. Tou, Purdue University.
 59-829. Analysis of Nonlinear Sampled-Data Control Systems, Part II I. E. Kinnen and J. Tou, Purdue University.
 59-830. Design of Continuous Linear Control Systems for Minimum Probabilistic Error. J. Zaborsky, Washington University and J. W. Diesel, McDonnell Aircraft Corp.
 59-831. Design of Sampled Data Control Systems for Minimum Probabilistic Error. J. Zaborsky, Washington University and J. W. Diesel, McDonnell Aircraft Corp.
 59-832. Optimization of Multi-Output Linear Time-Varying Systems Subject to Multiple or Redundant Nonstationary Inputs. E. L. Peterson, General Electric Co.

Wednesday, June 24

9:00 a.m.—Ionic Systems

59-833. Practical Considerations of an Ion Propulsion System. A. E. Lennert, The Martin Co.
 CP59-834. A Nuclear-Ionic System for Space Flight. J. E. Cobb, G. B. Shook and W. E. Cutler, Lockheed Aircraft Corp.
 CP.* Optimum Power Generation From a Moving Plasma. J. L. Neuringer, Republic Aviation Corp.

59-885. Some Effects of Hypersonic Ionization on the Design of Electrical and Electronic Components. W. B. Sisco and J. M. Fiskin, Douglas Aircraft Co., Inc.

9:00 a.m.—High Temperature Equipment

CP59-902. Design and Development of an Airborne Alternating Current Generation and Distribution System for Use in 600°F Ambients. J. J. Pierro, North American Aviation, Inc.
 59-848. A Solid Rotor A.C. Generator for High Temperature Electrical Systems. J. T. Bateman, General Electric Co.
 59-864. Generator Insulation Systems Development for Mach 3 Aircraft. W. B. Penn, R. L. Balke and F. M. Precopio, General Electric Co.

CP59-865. Bearing Systems for High Temperature Aircraft Generators. G. D. Bradley, General Electric Co.

59-771. Development of Fuses and Terminals for High Temperature II Applications. W. F. Bonwitt and H. Buttner, Burndy Corp

9:00 a.m.—Rotating Machinery

CP.* A Variable-Speed Reversible Drive Using an Induction Motor. G. Hansen and P. O. Berymer.
 CP59-811. Generalized Variable Speed Motors, Frequency Convertors and Variable Speed Drives. P. K. Charlu, P.S.G. College of Technology.

CP59-929. Veneer Lathe Drives in New Guinea. T. M. Googin, Consolidated Purchasing and Design, Inc. and R. P. Bleikamp, Westinghouse Electric Corp.

9:00 a.m.—System Planning

CP59-908. A Practical Approach to Economic Load Dispatching Between Interconnected Utility Companies. E. J. Burdick, Radio Corp. of America and Americo Lazzari, Arizona Public Service Co.
 CP59-858. Billing for Economy Energy in a Power Pool. P. G. Lubisch, Los Angeles Dept. of Water and Power.
 59-263. 230 KV Versus 60 KV Subtransmission. V. W. Ruskin and III A. Langmuir, B. C. Engineering Co. Ltd. (Re-presented for Discussion only)

CP59-802. A New Approach to Load Research. G. B. Tupper and L. H. Newman, Westinghouse Electric Corp.

59-817. An Introduction to the Study of System Planning by Operational Gaming Models. J. K. Dillard, Westinghouse Electric Corp. and H. K. Sels, Public Service Electric and Gas Co.

9:00 a.m.—Environmental Effects on Electrical Insulation

59-800. A Study of the Effects of Corona on Polyethylene. E. J. I McMahon, D. E. Maloney and J. R. Perkins, E. I. du Pont de Nemours & Co., Inc.
 CP.* Radiation Damage to Polypropylene and Poloxymethylene. L. M. Epstein, Westinghouse Electric Corp.
 CP.* Post-Irradiation Thermal and Electrical Properties of Magnet Wire Insulation. J. W. Kallander, Naval Research Laboratory.
 CP.* A Calculation of Absorbed Dose from Neutrons. C. H. Cheek and V. J. Linnenbom, Naval Research Laboratory.
 CP.* Electron Attachment and Its Effect on Pre-Breakdown Currents in Gases. R. Geballe, University of Washington.

9:00 a.m.—Data Communication

59-890. Simulation of Data Switching Systems on a Digital Computer. I F. J. Gross, Bell Telephone Labs., Inc.
 59-812. A High Volume, High Speed Weather Information Distribution System. E. E. Schwenzfeger, Bell Telephone Labs., Inc.
 CP.* Design Aspects of AM Digital Transmission Systems. C. R. Fisher, Stromberg-Carlson Co.
 CP.* Connecting an Asynchronous Data Source to a Synchronous Data Transmission System. F. E. Froelich, Bell Telephone Labs., Inc.

9:00 a.m.—Indicating & Integrating Instruments

CP59-875. Principles and Considerations in the Design of a Hall Multiplier. T. Barabutes and W. J. Schmidt, Westinghouse Electric Corp.
 CP59-876. Thermal Voltage Converters for Accurate Voltage Measurements to 30 Megacycles. F. L. Hermach, National Bureau of Standards.
 CP.* Linearity Tests of A-C Voltage Dividers. N. E. Morrison, Electro-Measurements, Inc.
 59-805. Correlation of Measured and Calculated Substation Ground I Grid Resistance. A. L. Kinyon, Bonneville Power Administration.

2:00 p.m.—Solar Power in Space

CP59-903. Solar-Mechanical Power Plant Design Problems. J. M. Stem, Wright Air Development Center, USAF.
 59-869. Optimum Reflector-Absorber Geometry for a Solar Generator. R. W. Stineman, Boeing Airplane Co.
 CP59-886. Photovoltaic Solar Energy Converters for Space Vehicles—Present Capabilities and Objectives. A. B. Francis and W. W. Happ, Lockheed Aircraft Corp.
 CP59-904. A Thermionic Power Supply Using Solar Heat for Space Application. E. F. Casey and G. Street, Jr., General Electric Co.

2:00 p.m.—High Temperature Equipment

59-883. New Materials for Transformer-Rectifier Unit High-Temperature Aircraft. J. G. Hoop and D. K. McIlvaine, Westinghouse Electric Corp.
 CP59-905. Electrical Components for 600°F. Control Circuit. K. A. Teumer, Sundstrand Aviation.
 CP59-906. Component Parts Status for 600°F. Aircraft Generator Control. J. P. Hanna and J. F. Scoville, General Electric Co.
 59-907. Computer Evaluation of High-Temperature Aircraft AC Electrical System Designs. W. E. Sollecito and D. A. Swann, General Electric Co.

CP.* 600°F Constant-Speed Drive—Mechanical Traction Type. C. D. Flanigen, Lycoming Division, AVCO.

2:00 p.m.—Nucleonics

CP59-928. Automatic Control of Boiling Water Reactors. W. C. Lipinski, A. Hirsch and C. A. Pesce, Argonne National Laboratory.
 CP.* Operational Testing of the GETR. H. T. Wells and J. O. Arterburn General Electric Co.
 CP.* Reliability and Fail-Safe Requirements for Nuclear Process Monitoring Equipment. R. Sherrard, General Electric Co.
 CP.* Cable Penetration Seals for the Dresden Reactor Enclosure. A. J. McCrocklin, General Electric Co. and S. P. Giambra, Bechtel Corp.
 CP.* The Electrical System of the Bevatron Rapid Beam Ejector. C. G. Dols, University of California Radiation Laboratory.

2:00 p.m.—Relays and Transmission & Distribution

58-1229. Distribution Protection as Used on the Portland General III Electric Co. System, Portland, Oregon. M. A. Bostwick, Portland General Electric Co.
 58-1196. Distribution Circuit Protection. E. L. Guenzel and W. T. III Morris, Texas Electric Service Co.
 CP59-941. Selective Ground Relaying of Distribution Lines on 4-8 Primary Amperes. C. Lowerison and F. V. Gillum, Southern California Edison Co.
 58-1322. High Speed Magnetic Air Breaker for Distribution Circuits. III H. P. Sleeper, Public Service Electric and Gas Co. and J. D. Findley, Westinghouse Electric Corp. (Re-Presented for Discussion only.)
 59-893. Zero-Sequence Current Density in the Earth. M. E. Forsman, University of Florida.

2:00 p.m.—Emergency and Scheduled Generator Shut-down

59-939. Response of Steam and Hydro Generating Plants to Generating Plants to Generation Control Tests. A. Klopfenstein, III Southern California Edison Co.
 59-852. Measurement of the Transfer Functions in the Electric Power III Systems Using Spontaneous Power Variations. M. Mesarovic, MIT; I. Obradovic, D. Kalic, and S. Spiridonovic, Nikola Tesla Institute.

59-851. Mathematical Models for Use in the Simulation of Power III Generation Outages—I Fundamental Considerations. C. J. Baldwin and D. P. Gaver, Westinghouse Electric Corp.; C. H. Hoffman, Public Service Electric and Gas Co.

59-849. Mathematical Models for Use in the Simulation of Power III Generation Outages—II Power System Forced Outage Distributions. C. J. Baldwin and D. P. Gaver, Westinghouse Electric Corp.; J. E. Billings and C. H. Hoffman, Public Service Electric and Gas Co.

59-850. A Study of the Economic Shut-Down of Generating Units in III Daily Dispatch. C. J. Baldwin and K. M. Dale, Westinghouse Electric Corp.; R. F. Dittrich, Public Service Electric and Gas Co.

2:00 p.m.—Round Table Discussion on Radiation Effects

2:00 p.m.—Communication Switching Systems
 59-824. A New Dynamic Impedance Matching Circuit As Applied To I A Conference Repeater. O. D. Grandstaff, General Telephone Labs., Inc.

CP59-825. Transistorized Universal Tone Detector. E. J. Glenner, General Telephone Labs., Inc.

59-826. A Small High-Speed Transistor and Ferrite Core Memory I System. W. L. Shafer, Jr., W. N. Toy and H. E. Priebe, Jr., Bell Telephone Labs., Inc.

CP59-827. Lossless Transmission Circuit for an Electronic Telephone Switching System Employing Time Division Multiplex Switching. L. K. Lugten, Automatic Electric Co.

CP.* Some Impressions of Telecommunications in the U.S.S.R. I. Molnar, General Telephone Labs., Inc.

7:30 p.m.—Electrical Problems in Space

Panel Discussion:
 CP.* W. H. Bostick, Stevens Institute of Technology.
 CP.* D. C. White, Massachusetts Institute of Technology.
 CP.* R. B. Kershner, Johns Hopkins University.
 CP.* C. W. Burrell, Lockheed Aircraft Corp.

Thursday, June 25

9:00 a.m.—Constant-Frequency Variable-Speed Generators

59-773. Constant-Frequency Variable-Speed Frequency-Make-Up Generators. B. V. Hoard, Boeing Airplane Co.
 59-780. Variable Speed, Constant Frequency Devices—A Survey of the Methods in Use and Proposed. T. B. Owen, Santa Monica, California.
 CP59-772. Precision Power Frequency With Variable Speed Generators. S. E. Rauch, University of California and L. J. Johnson, Hallamore Electronics Co.

- 59-872. Variable-Speed, Constant-Frequency Generator System For II Aircraft. K. M. Chirgwin and L. J. Stratton, Jack & Heintz, Inc.
- 9:00 a.m.—Testing of Vehicles in Flight**
 CP.* Instrumentation Requirements for a Long-Range Re-Entry Vehicle. J. E. Regar, General Electric Co.
- CP59-863. System Considerations in Flight Test Planning. V. G. Fauque, Westinghouse Electric Corp.
- CP.* High-Speed Data-Gathering System. W. D. van Dyke, Douglas Aircraft Co.
- CP59-860. Instrumentation for Research on Human Performance. D. B. Hatmaker, Lockheed Aircraft Corp.
- CP.* A Standardized Resistance Temperature Probe for Use in the Region of 300°F. G. R. Deppe, Aerojet-General Corp.
- 9:00 a.m.—Transmission & Distribution and Protective Devices**
 59-895. Lighting Protection of Equipment on Multiple Line Buses. III A. H. Knable, Allis-Chalmers Mfg. Co.
- CP.* Arrester Protection of High Voltage Stations Against Lightning. A. J. Schultz, R. H. Hopkinson, G. D. Breuer and I. B. Johnson, General Electric Co.
- 59-894. Switching Surge Voltages Due to the Interruption of Transformer Magnetizing Current. H. K. Amchin, American Electric Power Service Corp. and R. T. Curto, The Detroit Edison Co.
- CP.* Switching Surges on Energizing a Transformer Terminated Line. A. J. Schultz and I. B. Johnson, General Electric Co.
- 59-568. Shielding 13.8 KV Distribution Circuits. M. L. Hurstell and III M. G. West, New Orleans Public Service, Inc.
- 9:00 a.m.—Aluminum Substation Buses and Connectors**
 CP58-1286. Aluminum Angle Substation Bus Conductor. L. C. Weber, Northern States Power Co. and H. Fossum, Pioneer Service & Engineering Co.
- CP59-930. Fasteners for Electrical Connections on Aluminum Bus Conductors. J. W. Atman, W. J. Dewalt and D. H. Sandell, Aluminum Company of America.
- CP59-844. Corrosion Performance of Aluminum, Aluminized Steel and Galvanized Steel Hardware in Severe Marine Environments. T. A. Lowe, Kaiser Aluminum & Chemical Corp. and M. K. Dean, Hawaiian Electric Co.
- CP59-845. The Critical Aspects of Steel Hardware in Aluminum Connectors. W. Frank, Burndy Corp.
- 9:00 a.m.—Switchgear**
 59-187. Twenty Years' Experience With Outdoor Single-Tank Oil Circuit Breakers. S. Clare and W. O. Rowan, The Hydro-Electric Power Commission of Ontario. (Re-presented for discussion only)
- 59-846. High Power Laboratory Tests On High Capacity High Voltage Oil Circuit Breakers. N. E. Reed, Kelman Electric & Mfg. Co. and E. B. Rietz, I-T-E Circuit Breaker Co. (Re-presented for Discussion only)
- CP59-857. Improved Insulation in Metal-Clad Switchgear. R. Frink, Westinghouse Electric Corp.
- CP.* Experience With the Current Limiting High Interrupting Capacity Low Voltage Circuit Breaker. W. H. Edmunds, I-T-E Circuit Breaker Co.
- 9:00 a.m.—Microwave Relay Systems**
 CP.* The TJ Microwave Radio Relay System. S. D. Hathaway and J. Gammie, Bell Telephone Labs, Inc.
- 59-943. The Flagstaff-Phoenix TJ Radio System. J. W. Hidy, Mountain States Telephone and Telegraph Co.
- CP59-931. 96 Channel Multiplex System for on Carrier on Radio. M. Aruck and C. I. L. Cronberg, Jr., Bell Telephone Labs., Inc.
- 59-874. A New High-Capacity Microwave Relay System. C. G. Arnold, I V. E. Isaac, H. R. Mathwich, R. F. Privett and L. E. Thompson, Radio Corporation of America.
- 59-889. Microwave Systems on the Pacific Great Eastern Railway. I R. N. Doble, Pacific Great Eastern Railway Co. and J. E. Raftis, Canadian Motorola Electronics, Ltd.
- 2:00 p.m.—Thermoelectric Generators**
 59-867. An Elementary Design Discussion of Thermoelectric Generation. E. W. Bollmeier, Minnesota Mining and Manufacturing Co.
- CP59-937. Minimizing the Weight of Thermoelectric Generators in Space Applications. D. L. Kerr and R. L. Gessner, General Electric Co.
- 59-847. Solar Powered Thermoelectric Generator Design Considerations. II N. F. Schuh, Westinghouse Electric Corp., and R. J. Tallent, Boeing Airplane Co.
- CP59-887. Utilization of Thermoelectric Effects for Power Generation. W. W. Happ and S. R. Hawkins, Lockheed Aircraft Corp.

- 2:00 p.m.—Radio Communication and Television**
 CP.* Television-Education's Newest Partner in Seattle. J. L. Boor, KCTS-TV, Seattle, Washington.
- CP.* Some Technical Aspects of Video Tape Recording. J. L. Middlebrooks, Radio KING, Seattle, Washington
- CP.* Advancement in Mobile Communications. J. S. Smith, General Electric Co.
- 59-920. Global Public Telephone Service—1958. D. D. Donald and I T. A. Chandler, American Telephone and Telegraph Co. (Re-presented for Discussion only.)
- 59-944. A Transistorized Pulse Code Repeater. G. R. Partridge, Raytheon Mfg. Co.
- CP59-768. Spectral Folding in a Single-Tone FM Signal. J. J. Busgang, Radio Corp. of America and A. H. Nuttal, Massachusetts Inst. of Technology.
- 59-925. An Approach to the Study of Automatic Target Tracking. I L. Pode, Sherman Oaks, California.
- 2:00 p.m.—Space Vehicle Instrumentation**
 CP.* Analysis of Thermal Instrumentation Capability for Hypervelocity Re-entry Vehicles. L. Foster, General Electric Co.
- CP.* Motion Parameter Measurements for a Re-entry Vehicle Following a Ballistic Trajectory. J. Picard, General Electric Co.
- CP.* Integrated Instrumentation in Man-Vehicle Systems. C. Gibson, Douglas Aircraft Co., Inc.
- 2:00 p.m.—Transmission & Distribution**
 59-808. Electromagnetic Unbalance of Untransposed Transmission III Lines—III Double Circuit Lines. E. T. B. Gross, Illinois Institute of Technology; J. H. Drinnan, British Columbia Engineering Co., Ltd.; E. Jochum, Allis-Chalmers Mfg. Co.
- 59-807. Corona and Conductor Work Function. H. S. Dixon, Berkeley III Laboratory.
- 59-767. Development of a Square Law Radio Noise Meter—II. F. J. III Trebby, Kaiser Aluminum and Chemical Corp.
- 59-896. EHV Single and Twin Bundle Conductors—Influence of Conductor Diameter and Strand Diameter on Radio Influence Voltage and Corona Initiation Voltage. L. N. Stone, Oregon State College.
- 59-814. Radio Interference Attenuation on Energized H.V. Transmission III Lines, Measurement and Application. L. N. Stone, Oregon State College; R. S. Gens and E. H. Gehrig, Bonneville Power Administration.
- 2:00 p.m.—Mobile Transformers and Substations**
 CP59-842. Field Experience With 15,000 KVA Highway Mobile Transformers. R. E. Brown and J. W. Pettinos, City Public Service Board of San Antonio, Texas.
- CP59-843. Application of Large Mobile Transformers on Pacific Gas and Electric Company System. J. L. Buckley, Pacific Gas & Electric Co.
- CP59-932. Design of a 40 Mva Mobile Transformer/Autotransformer. J. E. Hall, General Electric Co.
- CP.* Railway and Highway Type Mobile Transformers on BPA System. L. I. Gradasoff, Bonneville Power Administration.
- 2:00 p.m.—Magnetic Amplifiers**
 59-788. Theory of Ferroresonance. J. T. Salihi, Lenkurt Electric Co., I Inc.
- CP59-789. Graphical Evaluation of Magnetic Amplifier Performance Based On Constant-Voltage Reset Test. D. Nitzan, University of California.
- 59-635. Shunt-Coupled Magnetic Amplifier Circuits. R. M. Hubbard, I Boeing Airplane Co. (Re-presented for Discussion only)
- 59-790. Magnetic Amplifier Circuits—A Classification of Half-Wave and Full-Wave Non-Reversible and Reversible Self-Saturating Circuits. D. L. McMurtrie, Raytheon Manufacturing Co. (Re-presented for Discussion only)
- 59-791. All Transistor Magnetic Core Memories. B. T. Goda, W. R. I Johnston, S. Markowitz, M. Rosenberg and R. Stuart-Williams, Telemeter Magnetics, Inc. (Re-presented for discussion only.)
- 59-776. The Winding Capacitances in Magnetic Amplifiers. I. J. I hansen, Massachusetts Institute of Technology.
- 2:00 p.m.—Solid State Devices**
 59-766. An Electric Analog of Heat Flow in Power Transistors. J. I Reese, W. W. Granneman and J. R. Durant, University of New Mexico.
- 59-909. Design Parameters for Optimizing the Efficiency of Thermo- I electric Generators Utilizing P-Type and N-Type Lead Telluride. R. W. Fritts, Minnesota Mining and Manufacturing Co.
- CP.* Measurement of Thermoelectric Materials Under Simulated Generator Conditions—II. C. S. Duncan, Westinghouse Research Labs.
- CP.* Theoretical Efficiency of Thermoelectric Generators with Constant Thompson Coefficient. D. L. Kerr and R. L. Gessner, General Electric Co.

- CP.* Encapsulation of Thermoelectric Materials. E. Fischer-Cal- brie, General Electric Co.
- 2:00 p.m.—Communication Theory**
 CP.* Figure of Merit for Information Networks. L. S. Schwartz, New York University.
- 59-809. An Experimental Study of Detection in Nonstationary Noise. I T. R. Williams and J. B. Thomas, Princeton University.
- CP.* An Error-Correcting Code for Quaternary Data Transmission. E. H. Scherer, Westinghouse Electric Corp.

Friday, June 26

- 9:00 a.m.—Power Sources**
 CP59-910. Conception Design of a Thermionic Space Power Plant. F. N. Huffman, The Martin Co.
- CP59-911. Nuclear Thermoelectric Power Supply. R. J. Harvey, The Martin Co.
- CP59-934. Minimum Weight Thermoelectric Generators Applied to Air Breathing Propulsion Systems. P. C. Holden and R. E. Klokow, Westinghouse Electric Corp.
- CP.* Generation of Electric Power in Space Vehicles by Means of a Cryogenic Fuel Powered Engine. H. Howard, R. Laughlin and N. Morgan, Vickers, Inc.
- 9:00 a.m.—Reliability**
 59-888. Reliability Analysis for Aircraft Generators. J. T. Duane and II L. J. Yeager, General Electric Co.
- 59-912. Functional Cycling to Assure Reliability of Aircraft Control II Equipment. R. E. Hulsey and L. L. Kessler, Westinghouse Electric Corp.
- CP59-871. A Method of Comparative Reliability Prediction for De- velopmental Design Selection. V. L. Grose, Boeing Airplane Co.
- 59-565. The Effect of Variable High Altitude Humidity on the Wear II of Non-Dusting Brushes. L. E. Moberly and J. L. Johnson, Westinghouse Electric Corp.
- 9:00 a.m.—Rapid Transit**
 CP59-856. Automania Gives Way to Rapid Transit in the Bay Area. J. C. Beckett, San Francisco Bay Area Rapid Transit District.
- CP59-782. Planning for Public Transportation. M. O. Anderberg, Seattle Transit System.
- CP.* A Study of Mass Transportation Needs in Metropolitan Los Angeles. C. T. Abbott, Coverdale & Colpitts.
- 9:00 a.m.—Pulp and Paper Industry**
 CP.* Practical Analysis of Regulating Systems for the Paper Indus- try. R. J. Farrell, Reliance Electric and Engineering Co.
- CP59-853. Cable Applications in Paper Mills. E. E. McIlveen, The Okonite Co.
- CP.* Application of Computer Control in Pulp and Paper Manu- facture. T. M. Stout, Thompson-Ramo-Wooldridge Products Co.
- 59-813. Transistor Amplistat Regulated Sectional Drive at South- II land Paper Mills. A. E. Vickery, Southland Paper Mills and G. E. Shaad, General Electric Co.
- 9:00 a.m.—Transmission & Distribution**
 CP59-859. Effect of Twin Conductor Arrangement on Transmission Line Constants. F. Taher, University of Cairo.
- 59-897. EHV Single and Twin Bundle Conductors—Electrical Char- III acteristics and Conductor Selection. E. Hazan, Kaiser Alumi- num and Chemical Corp.
- CP59-898. Short-Time Annealing Characteristics of Electrical Con- ductors Part I: Methodology. L. F. Roehmann, Kaiser Alumi- num and Chemical Corp.
- 59-899. Laboratory and Field Evaluation of Connectors and Other III Accessories for Aluminum Conductors in Severe Marine En- vironments. W. J. Sanders, Kaiser Aluminum and Chemical Corp.
- 58-449. High Strength Aluminum Alloy Conductors. E. W. Green- III field, Kaiser Aluminum and Chemical Corp. (Re-presented for Discussion only)
- 9:00 a.m.—Substations**
 59-781. Modular Design for Aluminum Substation Structures. G. W. III Swanson and P. A. McCleer, Consumers Power Co.
- CP.* Aluminum Alloy Substation Structures. J. E. Williams, Alu- minium Company of America and A. D. Sangdahl, H. K. Porter Co., Inc.
- CP.* Recent Developments in Aluminum Substation Structures. R. H. Vaterlaus, Kaiser Aluminum & Chemical Corp.
- 59-189. Rationalization of Electrical Clearances for Applications at III EHV's 230 KV to 460/500 KV. P. L. Bellaschi, Portland, Oregon. (Re-presented for discussion only.)
- 9:00 a.m.—Magnetic Amplifiers**
 59-765. Transistor—Magnetic Control Circuits For Aircraft Electric I Systems. A. W. Pratt, Jack & Heintz, Inc.

- CP59-784. Magnetic Amplifier Regulated Rectifiers. A. S. FitzGerald. Mill Valley, California.
- 59-785. Capacitively Coupled Magnetic Amplifiers. H. W. Collins, I Westinghouse Electric Corp. (Re-presented for Discussion only)
- 59-786. A More Stable Three-Phase Transistor-Core Power Inverter. I W. E. Jewett and P. L. Schmidt, Bell Telephone Laboratories, Inc. (Re-presented for Discussion only)
- 59-668. Analog Division Circuit. W. McMurray, General Electric Co. I (Re-presented for Discussion only)
- CP59-787. Use of a Series Saturable Reactor As a Fluorescent Lamp Dimming Ballast. P. E. Massie, Day-Ray Products, Inc.
- 9:00 a.m.—Transformers**
 59-783. An Economic Analysis of Distribution Transformer Applica- III tion. C. F. Mitchell, Commonwealth Edison Co.; J. O. Sweeny and J. L. Cantwell, General Electric Co.
- CP.* Universal Connectors for Distribution Transformers. M. Bren- ner, Penn-Union Electric Corp.
- 59-818. Vaporization Cooling for Power Transformers. P. Narbut and III A. J. Maslin, Westinghouse Electric Corp.; C. Wasserman, Baltimore Gas and Electric Co.
- 59-854. Fault Pressure and Gas Detector Relays. H. A. Fohrhaltz, III General Electric Co.
- 57-1146. Standard Basic Impulse Insulation Levels. Report by the III AIEE Standards Coordinating Committee No. 8, J. H. Foote, Chairman. (Re-presented for Discussion only)
- 9:00 a.m.—Plastic Insulated Telephone Wire and Cable**
 59-792. Manufacture of Composite Cable Sheath for Telephone Ex- change Cable. D. A. Hughes, Chatham, N. J.
- 59-777. The Design and Manufacture of Direct Burial Wire. J. L. I Robb and W. L. Roberts, Superior Cable Corp.
- CP59-793. Design of Polyethylene Insulated Multipair Telephone Cable. A. S. Windeler, Bell Telephone Laboratories, Inc.
- 59-778. Transmission Properties of Polyethylene Insulated Telephone I Cables At Voice and Carrier Frequencies. G. S. Eager, Jr., L. Jachimowicz, I. Kolodny and D. E. Robinson, General Cable Corp.
- 2:00 p.m.—Design Problems**
 CP.* The Materials Problem in Secondary Nuclear Power. W. L. R. Rice, Wright Air Development Center, USAF.
- 59-873. Nuclear Radiation and Electronic Equipment. J. R. Critten- den, General Electric Co.
- 59-913. Temperature Prediction in Thermal-Lag Equipment. P. B. II Richards, Thompson-Ramo-Wooldridge, Inc.
- 59-879. Characteristics and Measurement of Ripple in Aircraft Elec- tric Power Systems. O. Markowitz, U. S. Naval Air Develop- ment Center.
- 2:00 p.m.—Power Sources**
 CP59-914. Electrostatic Power Generation for Space Propulsion. O. P. Breaux, United States Air Force.
- CP59-835. Electrochemical Auxiliary Power Sources for Missiles and Space Flight. M. Eisenberg, Lockheed Aircraft Corp.
- CP59-915. A Simple Variable Speed Independent Frequency Gener- ator. A. K. Wickson, Canadian Westinghouse Co., Ltd.
- CP59-861. Space Electric Power Transmission. G. W. Bills, North American Aviation, Inc.
- 2:00 p.m.—Land Transportation**
 59-779. A High Capacity Maintenance-Free Generating System For II Motor Coaches. R. L. Larson, General Motors Corp.
- 59-492. Multiple-Unit Operation of Diesel and Electric Locomotives II on The Milwaukee Road. L. Wylie, Seattle, Washington.
- CP59-799. Semi-Conductor Rectifiers For Traction Power On Electric Railways. V. E. Staff, DeLew Cather & Co.; S. B. Lent, Metropolitan Transit Authority.
- 2:00 p.m.—Transmission & Distribution**
 59-900. Sag-Tension Computations and Field Measurements of Bon- III neville Power Administration. P. F. Winkelmann, Bonneville Power Administration.
- 59-868. Design of Overhead Lines With 5005 Aluminum Alloy Cables. III H. W. Adams, Reynolds Metals Co.
- CP59-901. Fatigue Characteristics of EC and 5005 Alloy Aluminum Wire. C. E. Burley, Reynolds Metals Co.
- 59-801. Factors Affecting Vibratory Stresses in Cables Near the Point III of Support. R. F. Steidel, Jr., University of California.
- 59-178. Improved Systems for Recording Conductor Vibrations. C. B. III Rawlins and J. R. Harvey, Aluminum Co. of America. (Re- presented for Discussion only)
- 2:00 p.m.—Transformers**
 59-281. Accelerated Aging Characteristics of Formex and Paper In- III sulated Wires in Transformer Oil. M. F. Beavers, H. H. Brustle, J. H. Carpenter and W. J. Degnan, General Electric Co.

AIEE SUMMER AND PACIFIC GENERAL MEETING AND AIR TRANSPORTATION CONFERENCE

- CP.* A New Insulation System. M. F. Beavers, E. L. Raab and J. C. Leslie, General Electric Co.
- CP.* Factors Affecting the Aging Characteristics of Various Wire Coating Materials in Transformer Oil. G. F. Lipsey and P. W. Juneau, Jr., General Electric Co.
- SP-76. Proposed Guide for Maintenance of Transformer Askarel. Report by Insulating Fluids Subcommittee of AIEE Transformer Committee, C. P. Xenis, Chairman.
- 58-1150. The Relationship Between Operating Voltage and the Standard Dielectric Tests for Power and Distribution Transformers. Dielectric Tests Subcommittee of AIEE Transformers Committee Working Group, H. H. Wagner, Chairman. (Represented for discussion only.)
- 2:00 p.m.—Wire Communications**
- 59-774. Synthesis of Cable Simulation Networks. R. W. DeMonte, I Bell Telephone Labs., Inc.
- 59-794. A New Transistorized Negative Impedance Telephone Repeater. R. P. Dimmer and E. L. Roback, General Telephone Labs.
- CP59-855. Design Features of the 45-C2 Carrier Telephone System. V. Babin, Lenkurt Electric Co.

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INSPECTION TRIPS

A program of inspection trips of both general and technical interest featuring Pacific Northwest industries has been arranged. Since the number of persons who may be accommodated on some of these trips is limited, you are urged to secure advance registrations as soon as possible. Advance registrations should be made on cards mailed to the members for this purpose. The inspection trips scheduled are:

Aerial Cruise—Hydroelectric Plants—Wednesday afternoon. Hydroelectric plants provide the prime energy source for Pacific Northwest utilities and many interesting projects are located throughout Washington. To provide a birdseye view of some of these plants, a plane trip lasting approximately five hours will fly to and circle major plants, including Puget Sound Power and Light Company Baker River project; City of Seattle Skagit River project; and the Grand Coulee, Chief Joseph, Rock Island and Rocky Reach Dams on the Columbia River. Bus leaves the Olympic Hotel at 12:30 p.m. The fare includes bus and plane trip and registration should be made in advance. In case the weather is bad and the trip cancelled, money will be refunded. Tickets—\$27.50 each.

Skagit Hydroelectric Project—City of Seattle. All day Wednesday or Friday. The City of Seattle's main power development on the Skagit River in scenic Mount Baker National Forest, 140 miles from Seattle, consists of three major dams—Gorge, Diablo and Ross. Located deep in the Cascade Mountains, the visitor has an excellent opportunity to view Washington mountain scenery at its finest. The trip includes a one-hour boat ride, a ride on an incline railway, inspection of the powerhouses and lunch and dinner at the site. Buses leave the Olympic Hotel at 6:45 a.m. This is a splendid family trip. Advance registration should be made to assure reservations. Ticket price, including meals—\$9.00.

Puget Sound Naval Shipyard, Bremerton—Tuesday afternoon. This includes a pleasant one-hour ferry trip across Puget Sound, and a tour of the Naval shipyard. The visitors will board the famous battleship *USS Missouri* and aircraft carrier *USS Coral Sea*, currently being converted to an angle deck carrier. Missile cruisers and destroyers are under construction and a large new drydock for the Forrestal class carriers is being started. The ferry will leave the Colman Dock in Seattle at 1:00 p.m. Ferry fare, to be paid on an individual basis, is \$1.50. No other charges.

White River Lumber Mill and Tree Farm, Weyerhaeuser Timber Company—All day Friday. The trip involves a 60-mile bus trip to a modern forestry and milling operation. Visitors will watch the making of timber products from the falling of giant firs to final manufacture in a modern mill. It includes logging operations, hydraulic barking, a residue burning power plant, and a scientifically-managed tree farm which will sustain a continuous supply of logs for the mill. The bus will leave the Olympic Hotel at 8:30 a.m. The cost of the trip includes a box lunch served in the woods. Ticket—\$4.50.

Scott Paper Mill, Everett—Wednesday afternoon. This trip involves a 30-mile bus trip to the largest bleached sulphite pulp mill in the world. It is one of the largest plants in the manufacture of paper tissue in the United States. The visitors will see the entire process of converting logs into all types of paper products. Buses will leave the Olympic Hotel at 4:30 p.m. Ticket—\$2.50. Dinner in the mill cafeteria—\$1.25.



Boeing Flight Center, Seattle, Washington

Boeing Airplane Company, Seattle Plant No. 2—Tuesday morning. This plant contains the largest single-owned private aerodynamics laboratory in the world, including wind tunnels where models of advanced types of aircraft and missiles are tested. One of the tunnels is transonic and the other is supersonic with a potential up to Mach 3. A third tunnel for speeds up to 18,000 mph is under development. The buses leave the Olympic Hotel at 9:30 a.m. Ticket—\$1.25.

Boeing Airplane Company, Renton Plant—Friday afternoon. This plant produces the KC 135 jet tankers for the Air Force and the 707 jet transports for commercial airlines, which have a speed of 600 mph. The visitors will observe the production of these giants of the air on the assembly line. The buses leave the Olympic Hotel at 1:30 p.m.—Ticket, \$1.75.

Pacific Telephone and Telegraph Company, Telephone Building—Monday and Wednesday afternoon and evening. This is a modern building with window areas kept to a minimum for defense reasons. It includes No. 5 crossbar equipment handling both local and long distance dialing. The tour will include a lecture-demonstration of direct distance dialing. Departure from the Olympic Hotel will be at 2:00 and 7:30 p.m. No charge.

Other Trips—Special Arrangement. Other trips will be available for those interested. These include a 30-mile bus trip to the hydroelectric plant of the Puget Sound Power and Light Company at Snoqualmie Falls. This is one of the oldest underground plants in the world, where the generators, originally installed in 1898, are located in the bottom of a man-made rock cavity reached by an elevator. Another trip is to the Alder and LaGrande hydroelectric plants of the City of Tacoma on the Nisqually River, involving a 60-mile bus trip.

HAWAII TOUR

An all-expense tour leaves the Seattle-Tacoma airport at 11:15 p.m., Friday, June 26, and returns July 5. Included in the tour is round trip transportation via Pan American Airways from Seattle to Honolulu and return to Los Angeles, San Francisco, Portland or Seattle. Also included is air transportation on an outer island trip, sightseeing, hotel room, meals and ground transportation. Address all correspondence to Bankers and Merchants Travel Service, 511 5th Avenue, New York 17, N. Y. The total cost is \$487.00, plus \$8.73 tax per person. A deposit of \$50.00 should accompany the reservation application.

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