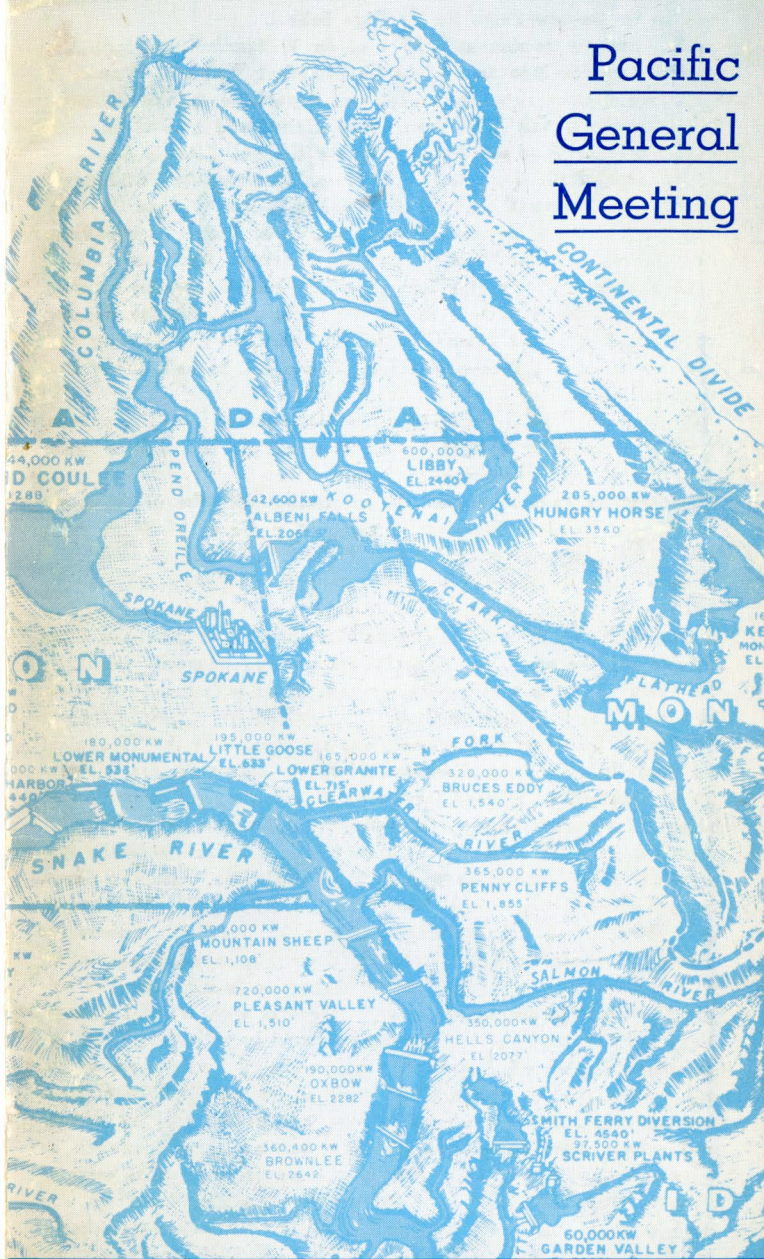




AMERICAN INSTITUTE *of* ELECTRICAL ENGINEERS

Pacific
General
Meeting



PASCO, WASHINGTON
August 28-30, 1957

GENERAL INFORMATION

For those who attend the Pacific General Meeting in Pasco, Washington, this year, there awaits an interesting program of stimulating technical sessions and social entertainment. With members of the Richland Section as hosts, we can assure our guests a most enjoyable and well-spent visit. Headquarters for the meeting will be in the new Pasco Senior High School.

The General Session at 9:30 a.m. on Wednesday morning, August 28, will include an address by President Walter J. Barrett. It will also feature speakers of national reputation in the fields of atomic power. Frank J. McCune, vice-chairman and general manager of the Atomic Products Division of the General Electric Company and Fellow of the Institute, will discuss, "Outstanding Problems in the Atomic Energy Field," U. M. Staebler, Chief, Civilian Reactors Branch, Division of Reactor Development, U. S. Atomic Energy Commission will discuss, "Power Reactors—Programs and Potential."

On the social side, a Stag Smoker will be held Wednesday evening. Sacajawea State Park will be the scene for the Thursday evening activities. The Pasco Elks Club will be available for dancing and club activities. The famous Ellenburg Rodeo will be held Labor Day week-end.

The several luncheons described at other places will be supplemented by a lunch service in the headquarters building. A wide selection of foods will be offered.

Registration Fees Required. In accordance with the policy as set up by the Board of Directors, a registration fee of \$5.00 has been established for members and a fee of \$8.00 for nonmembers. This is to help make the meeting self-supporting. Student members and the immediate families of members will not be required to pay any fee. **Information** on all features may be obtained at the registration desk. Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail are asked to inquire frequently at the mail and registration desk.

Technical Sessions and Discussions are covered by the "Technical Sessions Guide" at the discretion of the presiding officers. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication, discussions on TRANSACTIONS Papers in duplicate must be left with the chairman and/or sent to Edward C. Day, Assistant Secretary, Technical Operations Department, AIEE, 33 W. 39th Street, New York 18, N. Y., before September 13, 1957. Discussions received later may not be included, depending upon the printing schedule of the paper to which the discussion is directed. The original typewritten double-spaced copy, together with original illustrations as photographs or inked tracings should be submitted.

Advance Copies of Papers may be purchased by members at the registration desk at the uniform price of \$.40 each (\$.80 each to nonmembers). Only numbered papers are available. 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 \$10.00 denominations are available for those who wish to avoid remittance by check or otherwise. Mail orders should be addressed to the AIEE Order Department, 33 West 39th Street, New York 18, N. Y. The TRANSACTIONS Papers will also be published in the Bimonthly Publications. Note: Unnumbered Conference Papers (CP.*) may be available for sale 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.

Pacific General Meeting

SCHEDULE OF EVENTS

TUESDAY, AUGUST 27

12:00 noon Registration

WEDNESDAY, AUGUST 28

9:00 a.m. Registration

9:30 a.m. General Session

10:00 a.m. Ladies Brunch

12:00 noon Lunch

2:00 p.m. Power Generation
Nucleonic & Radiation Instruments
Human Engineering
Wire Communications

6:30 p.m. Ladies Buffet Dinner and Bingo Party

7:00 p.m. Stag Buffet Dinner and Smoker

THURSDAY, AUGUST 29

8:00 a.m. Trip to McNary Dam & Powerhouse
Registration

9:00 a.m. Transmission and Distribution
Nucleonics I
Industrial Power Systems I
Radio Communications

12:00 noon Student Luncheon

12:45 p.m. Ladies Luncheon with Bridge and Canasta

2:00 p.m. Substations
Nucleonics II
Conference on Industrial Power Rectifiers
Television and Aural Broadcasting

3:00 p.m. Trip to Ice Harbor Dam and Philips
Pacific Chemical Company Plant

THURSDAY, AUGUST 29

P.M. Student Meeting

Eve. Sacajawea State Park-Western Barbecue

FRIDAY, AUGUST 30

8:00 a.m. Midway Substation and Hanford
Works Area Tour

9:00 a.m. Power Generation—Gas Turbines
Safety
Industrial Power Systems II

2:00 p.m. Magnetic Amplifiers
Flight Test Instrumentation
Relaying
Space Heating

Wednesday, August 28

9:30 a.m.—General Session

2:00 p.m.—Power Generation

Presiding: R. L. Earnhart.
Room: 254

- CP.* Friction and Windage Loss Tests of McNary Generators With Coupled and Uncoupled Turbine. D. R. Cox, R. L. Krahn, U. S. Army Corps of Engineers.
- 57-904. Transient Performance of Excitation Systems. R. L. Krahn, U. S. Army Corps of Engineers.
- CP.* Planning and Design Considerations for Ice Harbor Powerhouse. G. H. Von Gunten, J. R. Kline, U. S. Army Corps of Engineers.
- CP.* Evolution of Design and Operation of Large Thrust Bearings. R. A. Baudry, Westinghouse Electric Corp.
- CP.* Performance of Generator Thrust Bearings at Hoover Power Plant. F. B. Looper, Dept. of Water and Power, City of Los Angeles.

2:00 p.m.—Nucleonic and Radiation Instruments

Presiding: L. H. Holthausen.
Room: 260

- 57-906. Safety Systems for Nuclear Power Reactors. I. M. Jacobs, General Electric Co.
- CP.* A Vernier Chronotron. H. W. Lefevre, General Electric Co.
- CP.* A Scintillation Well-Logging System. W. G. Spear, General Electric Co.
- CP.* Automation Neutron Spectrometers. E. J. Seppi, General Electric Co.
- CP.* Characteristics of Pressurized Water Reactor Plant Dynamic Pressure Measuring Systems. E. J. Brooks, Westinghouse Electric Corp.

2:00 p.m.—Human Engineering—Psychology In Design

Presiding: D. W. McLenagan.
Room: 265

- CP.* Human Engineering: An Aid to Improving Electronic Equipment. Dr. Maurice Rappaport, Stanford Research Institute.
- CP.* Advanced Instrumentation. Dr. Jesse Orlansky, Dunlap and Associates.
- CP.* Remote Handling and Manipulation of Radioactive Material. Dr. J. W. Wissel and Dr. J. C. Lee, Lockheed Aircraft Corp.
- CP.* Human Factors in Maintenance of Complex Systems. Dr. N. D. Warren, University of Southern California.

2:00 p.m.—Wire Communication

Presiding: S. J. McDermott.
Room: 261

- CP57-930. Applying Carriers to Existing Plant in Northern California-Pacific Telephone Co. E. M. Calderwood, Retired; G. A. Furniss, I. J. Robertson, Pacific Telephone and Telegraph.
- CP57-907. A Transistorized Repeater for Use with the 45BN Cable Carrier System. V. Babin, R. H. Fish, Lenkurt Electric Co.
- CP57-908. Application of 8 Kv Neutralizing Transformers. A. W. Adams, Bonneville Power Administration; R. E. Kistler, Pacific Telephone and Telegraph; T. W. MacLean, Washington Water Power Co.
- CP.* Carrier Telephone System as Used by Southern Pacific Railroad. R. R. Edwards, Southern Pacific Co.
- CP.* United States to Alaska Submarine Cable. C. A. Bartlett, American Telephone and Telegraph; T. H. Stewart, Alaska Communication System, U. S. Army.

Thursday, August 29

9:00 a.m.—Transmission and Distribution

Presiding: E. C. Starr.
Room: 254

- CP57-909 The Spokane-Lewiston 230 Kv Transmission Line. Earl Baughn, Washington Water Power Co.
- CP57-910. Simplified Sag Calculations for Power Transmission Lines. F. J. Hubert, Dept. of Water and Power, City of Los Angeles.
- 57-911. Surge Protection of Cable-Connected Power Transformers at Skatgood Steam Plant. C. M. Short, Water and Power Department, City of Los Angeles; T. J. Bliss, M. K. Enns, Westinghouse Electric Corp.
- CP57-912 The Digital Computer and Power System Short Circuit Calculations. Martin J. Lantz, Bonneville Power Adm.
- CP57-917. Application of Pole-Mounted Capacitors to a Primary Network Distribution System. C. F. Bannon, L. L. Gleason, Seattle City Light.

9:00 a.m.—Nucleonics I

Presiding: J. V. Kresser.
Room: 260

- 57-396. Some Operational Problems of the Nuclear Power Plant. R. L. Witzke, A. R. Jones, Westinghouse Electric Corp.
- CP.* A Method of Evaluating Reactor Hazards. A. B. Carson, K. W. Hess, L. H. McEwen, General Electric Co.
- CP.* Operating Hanford Reactors. D. S. Lewis, General Electric Co.
- CP.* Training Operating Personnel for Nuclear Power Plants. W. G. McKeown, Westinghouse Electric Corp.
- CP.* Bias Systems for Resonance Transformer Million Volt Electron Beam Generators. W. F. Westendorp, General Electric Corp.

9:00 a.m.—Industrial Power Systems I

Presiding: R. A. Erwin.
Room: 265

- CP57-926. Matching Power Systems to Industrial Safety Standards in the Pulp and Paper Industry. H. E. Springer, Rayonier, Inc.
- CP57-913. Electric Safety in the Cannery. R. S. Wilson, Consulting Electrical Engineer.
- CP.* Machine Grounding Practices. C. W. Cutler, Consulting Engineer.
- CP.* Power Supplies for an Operating Reactor. L. P. Reinig, General Electric Co.

9:00 a.m.—Radio Communication

Presiding: T. W. Stringfield
Room: 261

- CP.* Pocket Carried Radio Systems. John Mitchell, Motorola Inc.
- CP.* Modifying Transmitters for Single Sideband Operation. Norman Young, Federal Telecommunications Laboratories.
- CP57-914. Willamette Valley Radio System for the U. S. Corps of Engineers. C. Pederson, U. S. Army Corps of Engineers; D. J. Marihart, Bonneville Power Administration.
- 57-915. Microwave Radio Communication under Heavy Ice, Sleet and Snow Conditions on the BPA System. Emory Strong, E. J. Warchol, Bonneville Power Administration; Stanley Benson, Philco Corp.

2:00 p.m.—Substations

Presiding: A. A. Straub.
Room: 254

- CP57-925. Fire Protection and Minimizing Fire Hazards in Substations. Report of Working Group 54.2.

CP57-916. High Voltage-High Capacity Interrupting Test Facilities of Southern California Edison Company. E. E. Tugby, Southern California Edison Co.

CP.* Combined Single Phase and Three Phase Loading of Open Delta Transformer Banks. G. E. Gerngross and H. M. Bankus, General Electric Corp.

2:00 p.m.—Nucleonics II

Presiding: W. J. Dowis.

Room: 260

57-404. Electrical Problems in Electrical Burnout Testing of Nuclear I. Fuel Elements. T. W. Hunt, Westinghouse Electric Corp.

57-684. Analog Computer Study of the Transient Performance of a Dual Cycle Boiling Water Reactor Nuclear Power Plant. D. W. Leiby, General Electric Co.

CP.* A Cockroft-Walton Multiplier Design Study. R. N. Edwards, G. Jernakoff, General Electric Co.

CP.* Optimizing Reactor Design on a Digital Computer. J. O. Orton, General Electric Co.

CP.* Design of a Radially Symmetrical Heat Transfer Analogue. D. E. Sebade, General Electric Co.

2:00 p.m.—Conference On Industrial Power Rectifiers

Presiding: Waldo Porter.

Room: 265

A conference on safety, maintenance and operation of power rectifier stations.

CP.* Rectifier Safety Practices. J. M. Carlson, Alcoa.

CP.* Rectifier Operation. G. C. Walter, Reynolds.

CP.* Rectifier Inverter Operational Experiences. J. G. Harding, University of California.

CP.* Rectifier Maintenance. J. C. Whaley, City of Seattle.

CP.* Rectifier Supply for Chlorine Cells. J. R. Holmquist, Weyerhaeuser Timber Company.

2:00 p.m.—Television and Aural Broadcasting

Presiding: E. D. Barcus.

Room: 261

57-918. A Modified Microwave System for Color Television Transmission. F. F. McClatchie, Pacific Telephone and Telegraph Co.

57-919. A Video Differential Phase and Gain Equalizer. J. H. Clark, I. Pacific Telephone and Telegraph Co.

57-723. Statistical Encoding for Text and Picture Communication. I. W. S. Michel, Bell Telephone Laboratories. (For Discussion)

CP.* A New Automatic Frequency Control Circuit. L. B. Bennett, Pacific Telephone and Telegraph Co.

Friday, August 30

9:00 a.m.—Power Generation—Gas Turbines

Presiding: J. T. Madill

Room: 254

CP57-905. Gas Turbines Applied to Power Generation. K. L. Rieke, W. N. Hornberger, Westinghouse Electric Corp.

CP.* Large Gas Turbines for the British Columbia Power Commission. A. O. White, General Electric Co.

CP.* Large Gas Turbines for Central Station Application. Z. Stanley Stys, Brown-Boveri Corp.

9:00 a.m.—Safety

Presiding: H. E. Vann

Room: 261

57-920. A Compendium of Grounding Techniques for Personnel III. And Equipment Protection—H. E. Heddesheimer, General Electric Co.

FRIDAY (continued)

CP.* Comparison of Safety and Performance Requirements for Nuclear and Conventional Power Plants—A. F. Arley, Pacific Gas and Electric; E. P. Peabody, General Electric Co.

CP.* Safety in Nuclear Power Plants—S. Levy, General Electric Co.

9:00 a.m.—Industrial Power Systems II

Presiding: W. Ferguson

Room: 265

CP.* Electric Power Requirements of Oil Refineries in Pacific Northwest—J. T. Brannan, Shell Oil Company.

CP.* Effect of High Speed Breaker Reclosing on Industrial Power Systems. S. Durand and D. Dalasta, Allis-Chalmers Manufacturing Co.

CP.* Power Supply for the Hanford Atomic Plant—Ralph Haynes, General Electric Company.

CP.* Fault Testing on the Power System of the Hanford Plant—A. A. Maxwell, General Electric Company.

2:00 p.m.—Magnetic Amplifiers

Presiding: A. B. Rosenstein

Room: 254

CP.* Analysis of Non-Resonant Charging Circuit for Magnetic Pulse Generation—N. L. Weinberg, Westinghouse Electric Corp.

CP57-921 Core Reset Functions—Magnetic Amplifier Analysis. Pt. II. Determination of Amplifier Performance—G. C. Feth, General Electric Company.

CP57-922 Magnetic Amplifier Design—Pt. I The Core—R. E. Anderson, General Electric Company.

CP57-923 The Block-Diagram Method of Analysis Applied to the Saturable Reactor—R. M. Hubbard, Boeing Airplane Co.

CP.* A Transistorized Precision Frequency Standard Utilizing Magnetic Divider Circuits. E. B. Lachmar, North American Autonetics.

2:00 p.m.—Flight Test Instrumentation

Presiding: W. S. Pritchett

Room: 265

CP57-929. Transistorized Airborne Data Acquisition System—A. I. Morrison, Electrical Engineering Company of California.

CP.* Magnetic Recording of Flight Test Data—R. M. Strassner, Ampex Corporation.

CP57-928. A Miniaturized Instrumentation Converter System for Aircraft Flight Testing—H. E. Hommes, McDonnell Aircraft Corporation.

CP57-924 Improved Static Defect Calibration System—B. J. Heilweck, McDonnell Aircraft Corporation.

CP.* Development of Automatic Plotting Equipment for Telemeter Read-out. W. F. Sullivan, McDonnell Aircraft Corp.

2:00 p.m.—Relaying

Presiding: M. A. Bostwick

Room: 260

CP57-927. Improved Protection for Industrial and Commercial Loads with Emphasis on Coordination with the Utilities Protection—M. A. Bostwick, Portland General Electric Co.

CP.* Portable A-C Analyzer—P. G. Moore, General Electric Co.

57-796 Digital Short Circuit Solution of Power System Networks Including Mutual Impedance—M. J. Lantz, Bonneville Power Administration.

2:00 p.m.—Space Heating

Presiding: R. G. Scott

Room: 261

CP.* Electric Heating in Horticulture. J. A. MacCarthy, B-C Electric.

CP.* A Simplified Control for Combined Electric Heating and Cooling Installations. L. N. Roberson, L. N. Roberson Co.

CP.* Effect of Flat Rate on Domestic Electric Power Consumption. F. J. Mollerus, General Electric Company.

INSPECTION TRIPS

Several interesting inspection trips have been planned for the meeting. These include tours of the McNary Dam and Powerhouse on the Columbia River, the Ice Harbor Dam construction on the Snake River, and the 230 KV Midway Substation.

Members registering for the Pacific General Meeting are also asked to register in advance for these trips since the number of persons who can be accommodated on each trip is limited. In making trip reservations members should furnish names, nationalities, and business connections. Fees will be collected at the Registration Desk when tickets are picked up at the meeting headquarters.

Proof of United States citizenship will be required for the McNary Powerhouse and Midway Substation trips, and members should be prepared to comply with security regulations such as are in effect at the time of the meeting.

McNary Dam and Powerhouse, Thursday, August 29, 1957, 8:00 A.M. to 12:00 noon. A forty-two mile trip by chartered buses will be made to one of the great hydro-electric installations of the Northwest located on the Columbia River at Umatilla, Oregon. Outstanding features include the powerhouse, 1,422 feet in length with 980 megawatts installed capacity, the spillway for 1,368,000 cu. ft. per second at normal pool, the 92 foot single lift navigation lock and fish ladders for salmon migration to the headwaters of the Columbia and Snake Rivers. Ticket: \$2.50.

Ice Harbor Dam Construction and Phillips Pacific Chemical Company Plant, Thursday, August 29, 1957, 3:00 P.M. to 5:00 P.M. Visitors will have a choice of two short inspection trips: (1) Six miles from Pasco to see the early stages of Ice Harbor Dam construction, a hydro-electric dam and powerhouse which will eventually rival other large installations in the Northwest power system; (2) Nine miles from Pasco to see a chemical plant installation for the manufacture of anhydrous ammonia which was completed this spring. Ticket: \$1.00 each trip.

Midway Substation and Hanford Works Area Tour, Friday, August 30, 1957, 8:00 A.M. to 2:00 P.M. A trip by chartered buses to the Midway Substation. The buses will travel through the Hanford Works barricaded area giving an opportunity to see these important Atomic Energy Commission installations. Groups will stay aboard the buses; however, stops will be made at various reactors and chemical separation areas to enable guides to discuss process steps.

The Midway Substation is the hub of the Bonneville Power Administration main transmission grid, interconnecting Grand Coulee, Bonneville, and The Dalles Dams and the central Washington load areas. Because of Midway's strategic location and the number of interconnections, involving nearly a million kilowatts, it is extremely important from a system stability standpoint. Lunch will be served at Midway. Buses returning to Pasco will again pass through the Hanford area, but by a different route from that of the outgoing trip. Ticket: \$5.00.

We suggest that members traveling to this Pacific General Meeting by private automobile may well combine it with a pleasant vacation trip and use the opportunity to visit other important Pacific Northwest developments, such as the Grand Coulee and the Dalles dams on the Columbia River and the Kaiser Aluminum Plant near Spokane, Washington.

ENTERTAINMENT PROGRAM

The evening entertainment program has been planned so that sport or western clothes will be in order.

A Stag Smoker will be held Wednesday evening in the spacious Elks Club in Pasco. The club facilities and activities will be available and the cost will be a matter of individual choice. A buffet dinner will start at 7:00 PM and tickets will be \$2.50 each.

Sacajawea State Park will be the scene for the Thursday evening activities. There will be plenty of real western barbecue with all the trimmings. The Snake River Cowboys will be on hand to keep things moving. Several water sports activities will also be presented. The entire affair at Sacajawea Park will be covered by the \$2.00 tickets.

Following the activities at Sacajawea State Park facilities of the Pasco Elks Club will be available for dancing and club activities for those who do not have other plans.

LADIES PROGRAM

All visiting ladies will be guests at a brunch Wednesday morning at 10:00 in the patio of the Desert Inn in Richland. All persons planning to attend are urged to register in advance of Wednesday morning.

The Kennewick Country Club will welcome the ladies to a buffet supper Wednesday evening at 6:30. The supper will be followed by a Bingo Party. Tickets will be \$2.75.

The Officers Club in North Richland will be the location for Luncheon on Thursday at 12:45 PM. Bridge and Canasta will follow the luncheon. Tickets will be \$1.75.

Ladies are cordially invited to play golf at any time at the Kennewick Country Club. It is suggested that ladies who are not interested in inspection trips may find golf and swimming at the Kennewick Country Club to be a very pleasant morning activity.

The Tri-Cities have many park areas and facilities which are ideally suited for family picnicking, swimming, tennis and recreational activities. Riding horses are generally available.

The weather in the Tri-Cities will probably be warm. Clothes and shoes should be cool and comfortable. Sun dresses with jackets are especially good and a sweater or stole should be included for the cool evenings.

STUDENT PROGRAM

Informal gatherings on Wednesday will help the students of Districts #8 and #9 get acquainted and meet the students from other districts.

The Student Luncheon Thursday noon in the Cafeteria of the Pasco Senior High School will provide further opportunities to get acquainted. President Walter J. Barrett will discuss, "Knowledge and a Dual Responsibility." All engineers from student members to life members are invited to hear what President Barrett has to say.

The Thursday afternoon meeting for students will feature presentation of two top-ranking district contest papers and will include a discussion of student branch affairs.

The Faculty Counselors meeting will also be held Thursday afternoon.

The student programs have been arranged to permit student participation in the many interesting inspection trips and technical programs. The entertainment and ladies programs have been planned to offer many items of interest to students.

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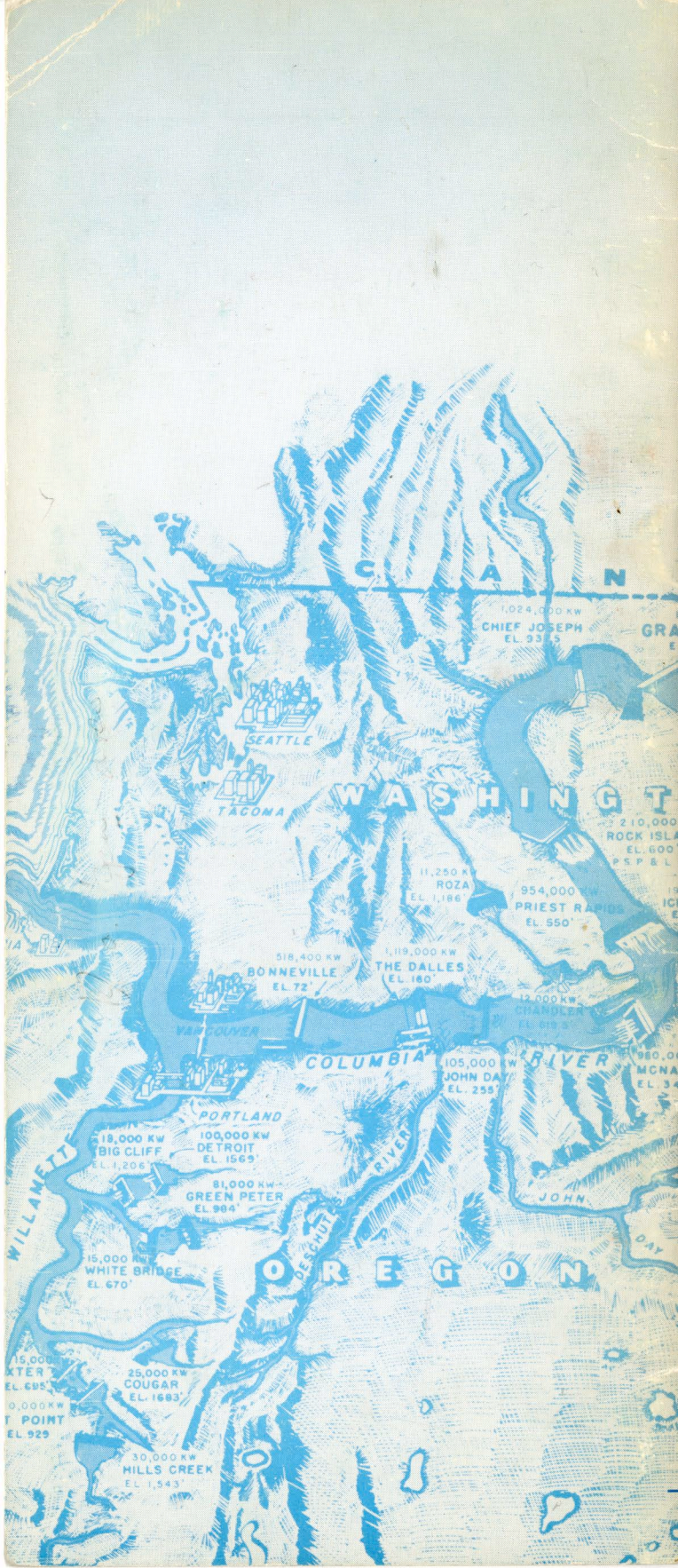
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1,024,000 KW
CHIEF JOSEPH
EL. 935'

GRA
E

SEATTLE

TACOMA

WASHINGTON

210,000
ROCK ISLAND
EL. 600'
PSP & L

11,250 KW
ROZA
EL. 1,186'

954,000 KW
PRIEST RAPIDS
EL. 550'

518,400 KW
BONNEVILLE
EL. 72'

1,119,000 KW
THE DALLES
EL. 160'

12,000 KW
CHANDLER
EL. 613.3'

VANCOUVER

COLUMBIA RIVER

105,000 KW
JOHN DAY
EL. 255'

980,000
MGN
EL. 34'

PORTLAND

18,000 KW
BIG CLIFF
EL. 1,206'

100,000 KW
DETROIT
EL. 1569'

81,000 KW
GREEN PETER
EL. 904'

15,000 KW
WHITE BRIDGE
EL. 670'

OREGON

15,000 KW
KTER
EL. 695'

25,000 KW
COUGAR
EL. 1683'

30,000 KW
HILLS CREEK
EL. 1,543'