

TECHNICAL BRIEFS

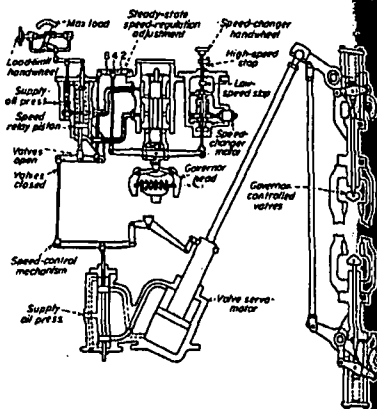
Latest engineering developments for busy power men

15 Digests for you on:
HYDRO POWER
PRIME MOVERS
POWER DISTRIBUTION



OWENS RIVER GORGE, above, has regular indoor generator inside special weather-proof housing. Lower portion, 16 ft high, is permanent; upper section, 12 ft high, has one-piece removable cover for maintenance. Crane also weather-proofed

GOVERNING SYSTEMS on modern steam turbines, right, operate almost without friction losses. Speed-sensing element works through a small pilot valve rotating in oil under pressure. Two oil relays, servo motors, amplify this action many times



Hydro Power

Electrical Features of the Owens River Gorge Project. By O L Sidenfaden, Department of Water and Power, Los Angeles, Calif.

The 112,500-kw Owens River Gorge hydroelectric development has 10.5 miles of tunneling, 3.5 miles of penstock and 260-miles of 230-kv transmission line. It consists of three 37,500-kw single-unit plants operating in series to use a total head of 2400 ft in three 800-ft steps. These plants use the water stored in Crowley Lake reservoir. A long pressure tunnel and short penstock connects this reservoir to the Upper Gorge plant. A second pressure tunnel connects the tail bay of this plant to the surge chamber and penstock of the Middle Gorge plant. A pressure tunnel, siphon and long penstock form the water channel from the Middle to the Control Gorge plant. The Upper and Middle plants are controlled by supervisory control from the Control plant.

Each plant consists of a 51,200-hp turbine, its generator, 11-kv switchgear, step-up transformer bank, synchronous bypass valve and auxiliary equipment. The generator, 11-kv switchgear and all

230-kv equipment are installed outdoors. A control house is provided for the supervisory-control equipment, automatic and manual start equipment, relays and station service equipment. Auxiliaries are located in the space below the generator deck.

The Control and Middle plants are now in operation and the Upper plant will go on line this spring. Test and operation of the two completed plants have been highly satisfactory and indicate that the use of outdoor construction, identical units and supervisory control of this project will fulfill the requirements set up at the start of design engineering. AIEE Paper No. 53-23.

Design Features of Automatic and Supervisory Control of the Calgary Power, Ltd. Hydro Electric System. By T E Cardell, M W Clarke and H Randle, Calgary Power, Ltd., Calgary, Alta., Canada.

The author's company plans centralized control of its eight hydro-electric plants and the transformer and switching stations on its main 138-kv transmission system. Six of these plants and

their substations are now in operation as unattended plants controlled from a central dispatching station. Representing about two-thirds of the company's 156,000 kw hydro generating capacity, they range from 4000 to 50,000 kw ratings. These plants are parts of an interconnected system with 281,000 kw total capacity in ten hydro and six steam plants. A 20,000 and a 30,000-kw plant are now being converted to remote operation.

A 12,000-kw single-unit plant, completed in 1947 was designed as a semi-automatic supervisory controlled station. Success of this plant led to the conversion of a 20,000-kw station in 1949 which also involved automatic control of a three-unit pumping installation. A development of three plants in series hydraulically, totalling 74,000 kw and using a head of 1300 ft was designed for automatic and remote control and completed in 1951. Cost of the automatic and supervisory equipment to date is less than the estimated cost of housing accommodation for manual operation of the plants.

Protective features, synchronizing

How to make packings last longer
by Johns-Manville Engineers to help you keep production rolling



Keep equipment
in repair
for best
packing service

Worn shafts wear me down

Trying to make packing compensate for excessive shaft or rod wear will shorten packing life materially without alleviating the undesirable condition. Pack correctly to avoid excessive shaft and rod wear. Replace worn shafts and rods as soon as possible to avoid adding the expense of damaged packings to the cost of parts replacement.



Keep my lantern clear

If the stuffing box is equipped with an oil, grease or water lantern, its purpose is defeated when the lantern ring is omitted or the opening blocked by improperly installed packing or other obstruction. This can deprive the packing of lubrication or cooling and result in premature failure.

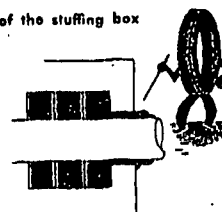


"Leaking" shafts throw me off my feet
Leaking shafts are for sealing only. They compensate for shaft misalignment or vibration by over-tightening and excessive gland pressure in stored shafts and packing. Think of a stuffing box as a potential brake assembly that develops considerable friction resistance with attendant wear.



Get me out of the stuffing box

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