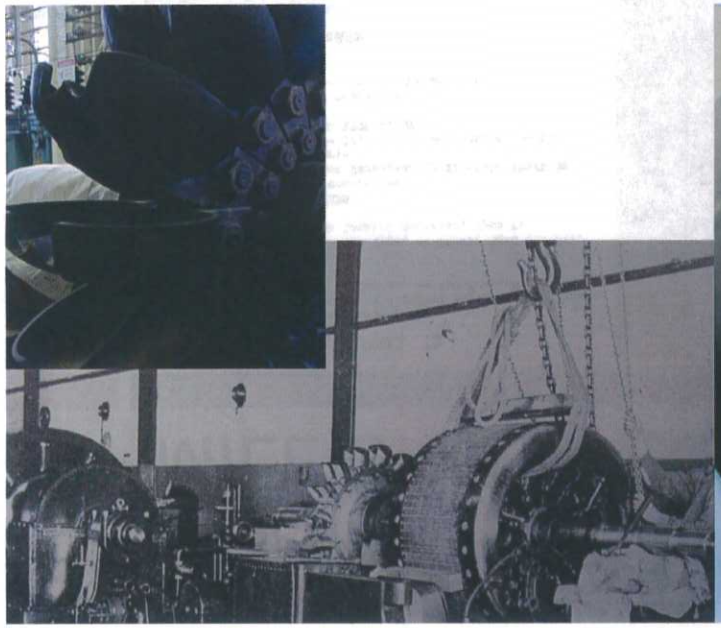
MILL CREEK POWER PLANT

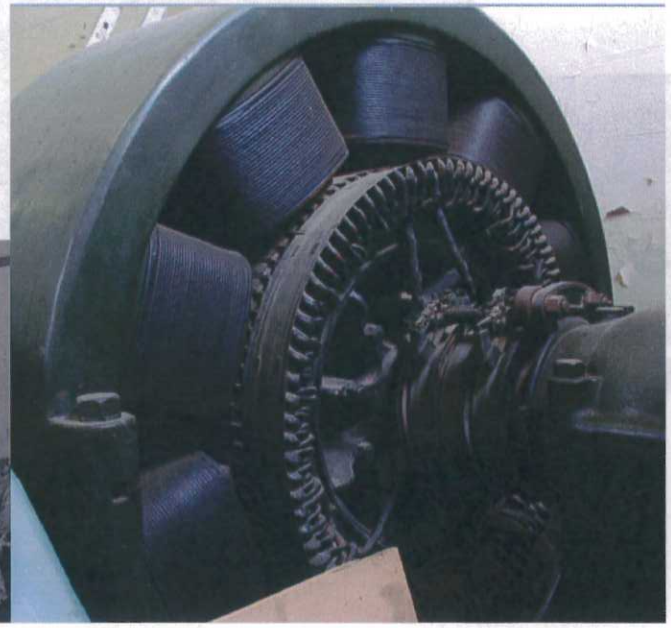
ELECTRICAL ENGINEERING MILESTONE

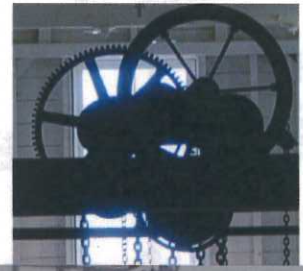
MILL CREEK NO. 1 HYDROELECTRIC PLANT

Built by the Redlands Electric Light and Power Company, the Mill Creek hydroelectric generating plant began operating on 7 September 1893. This powerhouse was foremost in the use of three-phase alternating current power for commercial application and was influential in the widespread adoption of three-phase power throughout the United States.

- Generator made by AEG (Germany) and Westinghouse
- 50 Hz in 1893, converted to 60 Hz in 1948







MILL CREEK EQMT & ONE LINE

GENERATORS & EQUIPMENT

(1) - 3 - G. E. Co. Alternating Current Generators:-
Type TY51, — Form A, — Revolving Armature Type, — 2300 Volts, — 58 Amps., — 3 Phase, — 50 Cycles, — 250 Kva., — Direct Connected to
3 - Pelton Hydraulic Turbines:-
Single Jet, Single Impulse Wheel Type, — Static Head 510 Ft., — Speed 600 R.P.M., — With Lombard Governor, Type F.

EXCITERS

(2) - 1 - Fairbanks Morse Direct Current Generators:-
Type TR, — 110 Volts, Direct Connected by flexible shaft to
1 - Western Electric Induction Motor:-
Type CS10A, — 220 Volts, — 17.2 Amps., — 3 Phase, — 50 Cycles, — 7½ H.P., — Speed 1700 R.P.M.

(3) - 1 - Thompson-Houston Direct Current Generator:-
110 Volts, — 1600 R.P.M., — Direct Connected to
1 - Pelton Water Wheel Turbine.

TRANSFORMERS

(4) - 3 - Wagner Single Phase Transformers:-
Indoor Type, — Water Cooled, — 2.3/30 Kv., — 250 Kvs. each, — 50 Cycles.

CRANE

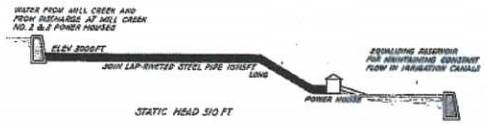
(5) - 1 - 3-Ton Traveling Crane, — Hand Operated.

TELEPHONE

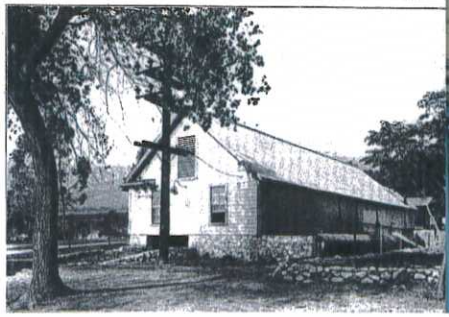
(6) - 1 - Pole Box with Wall Panel.
1 - Wall Panel and 4 Line Switching Panel in Plant.

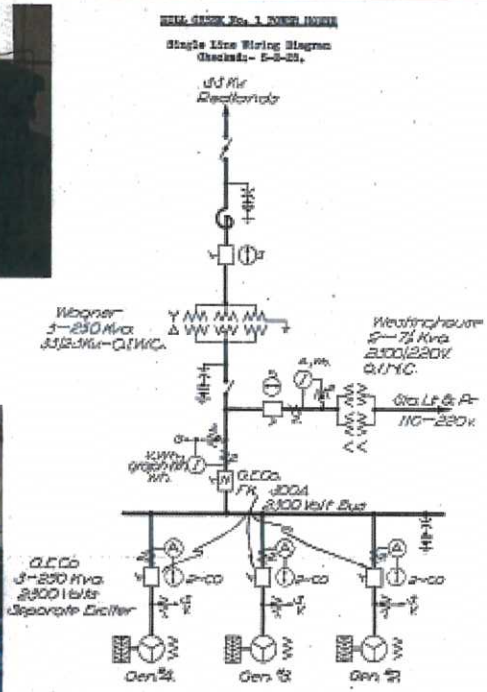
HYDRAULIC PLAN

(7) -



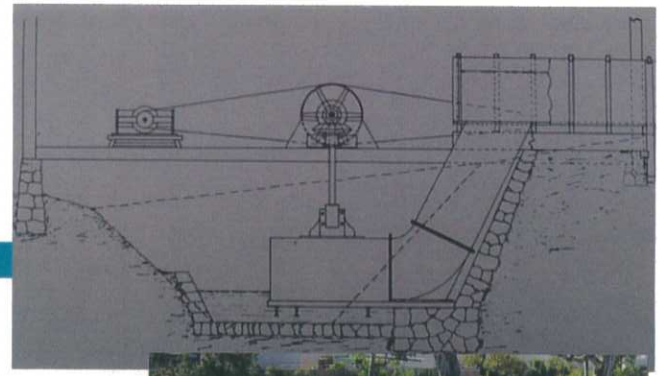
MILL CREEK NO. 1 POWER HOUSE
Location: REDLANDS DISTRICT (5-54) L-V

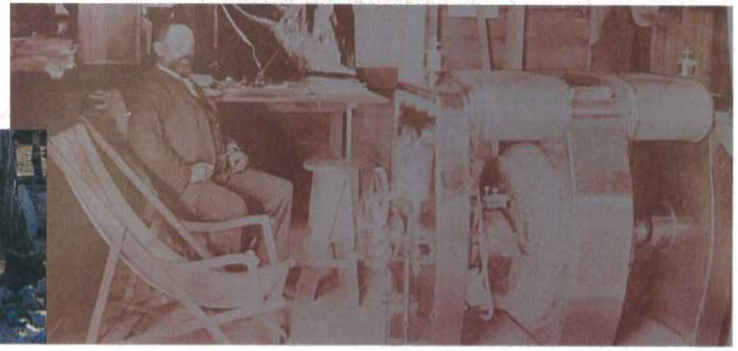




HIGHGROVE POWER PLANT

- Built by Riverside Water Company and Charles Lloyd who leased power privileges for $250 per month… *"to remove the electricity from the water"*
- Gauge irrigation canal with a drop of 50 feet to generate electricity, powered 15 arc lights in Colton and Riverside (each)
- Designed by Chief Engineer G. Newman (Civil engineer - Riverside Water Company)
- First commercial hydroelectric plant built in California

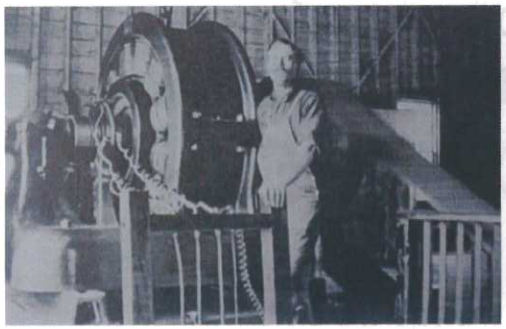




HIGHGROVE POWER PLANT

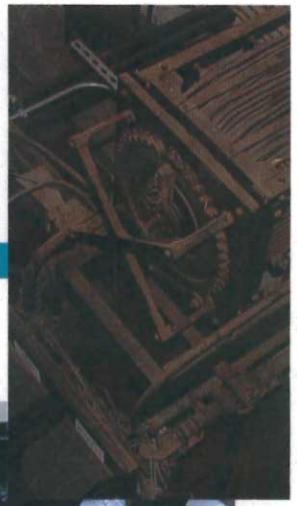
- Operated in 1887 with 3 water wheels and 3 direct current dynamos (DC), converted to AC in 1902
- Destroyed by fire in 1915, SCE picked up the lease for $250/mth, until 1952

AC Generator 1902

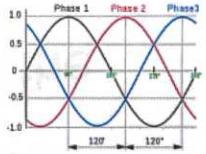


Highgrove water cooled transformer 1902

LONG DISTANCE TRANSMISSION



- Mill Creek 1893 revolutionized power utilities design with 3-Phase AC power
- Customer wanted ice for citrus industry shipments

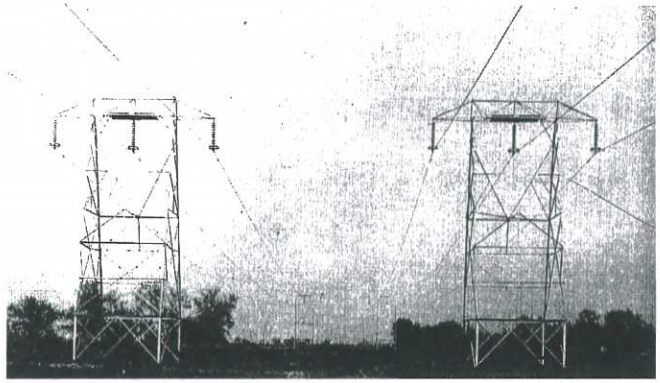


RIVERSIDE TRANSMISSION SYSTEM

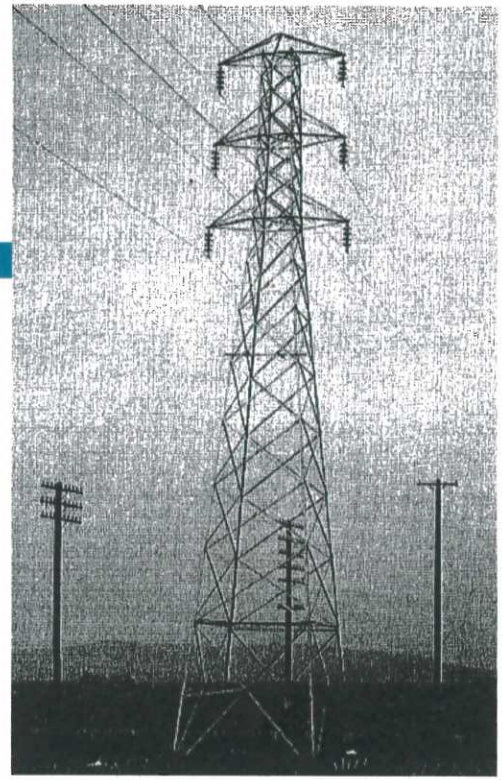
- A pioneer in long distance electrical transmission, 20 cents per kilowatt hour in 1900's
- 10/2.2kv transformers in first substation
- Demand exceeded 250KW from Mill Creek
- 1900 steam generating plant built
- 1907 City adopted charter prohibiting the sale of the electric system
- 1928 distribution system increased to 4,150V
- Capacitors reduced losses by 25%
- 1950, 33kv supply system solely from SCE

EARLY TRANMISSION LINES

220 KV. TRANSMISSION LINES
BIG CREEK LINE



Location - Big Creek
Circuits - Single, (Double Line)
Voltage - 220,000
Conductors - 605,000 CM., ACSR.
Normal Span - 660'
Max. Tension - 6500#
Length In Miles - 241
Ground To Lowest Conductor - 36'
Year Built - 1912
Termini - Big Creek #1 - Eagle Rock Substation



Location - Colton - L. A. #3.
Circuits - Double
Voltage - 66,000
Conductors - 4/0 Copper
Normal Span - 660'
Max. Tension - 3200#.
Length in Miles - 54
Ground to Lowest Conductor - 49'
Year Built - 1913.
Termini - Colton Substation, Los Angeles #3 Substation.