

DATES AND COSTS:

PLANT: GROUND BROKEN IN 1973.

FIRST SIX UNIT RUN IN 1986 (13 YEARS UNDER CONSTRUCTION)

COST: \$63.8 MILLION

BUCKSKIN MOUNTAIN TUNNEL: GROUND BROKEN IN 1975.

COMPLETED IN 1980

COST: \$65.8 MILLION

TOTAL COMBINED COST: 129.6 MILLION (1986 DOLLARS)

WATER RATES, 1999

MUNICIPAL & INDUSTRIAL: \$54 PER ACRE FOOT

AGRICULTURAL: \$24 TO \$33 PER ACRE FOOT

DELIVERIES TO INDIAN TRIBES: \$00 PER ACRE FOOT

INDIVIDUAL UNIT START REQUIRES 50 MEGAWATTS (COMPARE TO PARKER DAM
MAXIMUM POWER OUTPUT OF 108 MEGS, OR LAKE HAVASU CITY ON A HOT DAY, USING 45
MEGS.)

PUMP AND MOTOR COMBINED WEIGHT: ABOUT .5 MILLION POUNDS.

BUCKSKIN MOUNTAIN TUNNEL: SEVEN MILES LONG, BORED FROM BOTH ENDS BY A 23.5
FT DIA. "MOLE". FULLY LINED WITH PRECAST, 22 FT. INSIDE DIA. SEGMENTS.
APPROXIMATELY 860 FT. ABOVE THE PUMPS.

HEAD PRESSURE AT DISCHARGE VALVE IS ABOUT 390 PSI.

SIX PUMPS PRODUCE ABOUT 4.5 ACRE-MEET PER MINUTE (1.5 MILLION GALS PER MIN.)

LEVEL #1 IS ABOUT 90 FT BELOW LAKE LEVEL.

ONE ACRE-FOOT OF WATER = 325,851 GALLONS.

ONE 2nd GENERATION PUMP PRODUCES 278,256 GALLONS PER MINUTE.

ONE 1st GENERATION PUMP PRODUCES 242,352 (83,500 GALS. LESS) PER MINUTE.

(BASED ON 2nd GEN. IMPELLERS)

ONE PUMP WILL PRODUCE 16.7 MILLION GALS PER HOUR (400 MILLION GALS PER DAY)!!

ONE PUMP WILL PRODUCE 1,230 ACRE FT PER DAY.

ENTIRE PLANT WILL PRODUCE 2.4 BILLION GALLONS PER DAY.

ENTIRE PLANT WILL PRODUCE 7,380 ACRE FT PER DAY.

PLANT, AS BUILT, HAD HEAVY PULSATION.

CAP HIRED CONSULTANTS, AND THEIR FINDINGS INDICATED THAT THE STRUCTURE, INCLUDING DISCHARGE LINES WAS TUNED TO 120 HERTZ (ORIGINAL VANE PASSING FREQUENCY) WHICH ALLOWED HARMONICS TO OCCUR.

A 2nd GENERATION DESIGN IMPELLER (VANE PASSING FREQUENCY OF 77 HERTZ) HAS BEEN INSTALLED ON UNITS 1,2, & 5, RESULTING IN:

1. PULSE REDUCTION OF 75%
2. SOUND REDUCTION FROM 120 D. TO 90 D. (90% REDUCTION IN SOUND PRESSURE)
3. AN INCREASE OF 2% IN EFFICIENCY.
4. A 100 CFS INCREASE (FROM 520 CFS TO 620 CFS) IN PER PUMP CAPACITY.

COMPLETING THE INSTALLATION OF ALL 2nd GENERATION IMPELLERS WILL RAISE THE TOTAL PLANT CAPACITY FROM 3,120 CFS TO 3,720 CFS, IN EFFECT GIVING US A SEVENTH UNIT.

HAVASU MAIN UNIT SPECS.:

MOTOR

HORSEPOWER 60,000
 START M-WATTS 50,000
 VOLTAGE 13,800
 SPEED 514 RPM
 PHASE/AMPS 3/2160
 ACCELERATION,
 0-SYNCHRONOUS 20 SEC.
 START TIME, TO
 VALVE "OPEN" 40 SEC

MOTOR DIMENSIONS:

HEIGHT (SOLE
 PLATE TO TOP
 OF COLLECTOR) 18.8 FT.
 DIAMETER 17.5 FT.
 ROTOR DIA. 10.2 FT.

WEIGHT OF ROTA-
 TING PARTS 115.5 TON

Rotor weight - 115 TONS
 Station weight 66 TONS

PUMP

CAPACITY 520 CU.FT.SEC.
 CAPACITY 242,350 G.P.M.
 DISCH. PIPE 54" DIA.
 RUNAWAY, MAX. 664 RPM
 RATED EFFICIENCY 91.35%

PUMP DIMENSIONS:

SHAFT LENGTH 12 FT.
 IMPELLER DIA. 8.3 FT.
 IMPELLER WEIGHT 13 TON
 (INCL. NOSE CONE)
 ASSY WEIGHT 40.5 TON
 DISCHARGE LINE
 DIA. 12 FT.
 SHAFT DIAMETER 40.5"

MOTOR TOTAL
 WEIGHT

224.5 TON

SURFACE COOLER 2000 LBS
 IMPELLER 12 TON
 SHAFT 8 TON

OIL CAPACITIES:

Transformer deck

Transformers

- 3 @ 13,430 gallons
- 1 @ 849 gallons
- 1 @ 539 gallons

Lube Room

Unfiltered oil

Filtered oil

Miscellaneous drums

Miscellaneous 5-gallon Oil Containers

Pumps

upper motor bearing reservoir

6 @ 450 gallons

lower motor bearing reservoir

6 @ 320 gallons

pump guide bearings and reservoirs

6 @ 870 gallons

1640 TOTAL PER UNIT.

Hydraulic Systems

2 @ 570 gallons each

Sump Pumps

2 shaft bearing oilers @ 1/2 gallon each

2 upper bearing reservoirs @ 1 gallon each
