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METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

September 29, 1993

To: Board of Directors (Engineering and Operations Committee-Information)
(Finance and Insurance Committee-Information)

From: General Manager

Subject: Final Report on the Colorado River Aqueduct Pump
Rehabilitation Project

Report

During the early 1980s, maintenance inspections of the Colorado River Aqueduct (CRA) System revealed that the pumping units were in need of major rehabilitation. A task force recommended that a five-year program entitled the Colorado River Aqueduct Pump Rehabilitation Project (CRAPRP) be initiated to rehabilitate Unit Nos. 1 through 9 at all pumping plants with the goal of improving reliability, increasing efficiency, and extending the service life of the units. The recommendation also included rehabilitation of eleven 230kV transformers and other related work that would improve operations. Your Board approved this program for an estimated total cost of \$14,550,000 in Capital funds, and \$19,500,000 in Operation and Maintenance funds.

Overhauling the 45 pumps, motors, and discharge valves was successfully completed in nine phases. The first two phases were completed in 26 and 23 weeks respectively; by the last phase the same work was completed in only 14 weeks. The reduced time required to complete the work was attributed to increased employee efficiency, job knowledge, and utilization of a project management team concept. Also, significant manpower efficiencies were realized through innovative use of purchased and District-designed and fabricated equipment. Contract labor was used to supplement District employees at the pumping plants and at the maintenance shops at the La Verne facilities. These workers were supervised by District employees and worked only when needed. It is estimated that this strategy saved the District about \$1,000,000.

The pumps, motors, and discharge valves were restored to "as-new" conditions (36 pump impellers were replaced and the remaining nine were refurbished). The average efficiency of the pumps was increased from 82.5 percent to 87.75 percent (5.25 percent increase). The average pump capacity was increased by approximately 13 percent, from 205 cfs to 233 cfs, to restore overall system reliability. The aqueduct was designed for 1,607 cfs capacity and eight operating pumps plus one spare pump at each pumping plant. The aqueduct has a proven capacity of about 1,800 cfs. The added pump capacity permits 1,800 cfs delivery with one spare pump at each plant. Eleven transformers were rehabilitated, reducing core losses by 50 percent.

Estimated annual energy savings, based on a delivery of 1,212,000 acre-feet of water, are 109 million kilowatt-hours per year. This represents an annual savings of about \$2,200,000 based on the current cost of power of about 20 mills per kilowatt hour.

In addition to completing the project on schedule, the total costs were within budget. A review of the project costs revealed that of the \$34,050,000 approved by your Board, \$32,700,000 had been expended through July 1993. The projected final cost of the project is \$33,200,000.

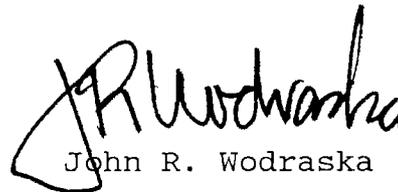
Board Committee Assignments

This letter was referred to the Engineering and Operations Committee because of its jurisdiction over the operation, protection, and maintenance of the plants and facilities required for the production, exchange, sale, storage, treatment, and delivery of water and power pursuant to Administrative Code, Section 2431, Subdivision (c).

This letter was referred to the Finance and Insurance Committee because it has jurisdiction over appropriations pursuant to Administrative Code Section 2441, Subdivision (d).

Recommendation

For information only.



John R. Wodraska