APPROVED
by the Board of Directors of
The Metropolitan Water District
of Southern California
at its meeting held

FEB - 8 1994

Karen E. Duff
EXECUTIVE SECRETARY

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METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

January 25, 1994

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

From: General Manager

Subject: Appropriation No. 675 for $6,576,000 to Finance Estimated Costs for the Design, Procurement, and Installation of a Supervisory Control and Data Acquisition System for the Water and Power operations of the Colorado River Aqueduct Pumping System

Report

The water and power operations of the Colorado River Aqueduct (CRA) are coordinated from the Gene Dispatch Control Center (DCC) located near the intake of the CRA system. The DCC is manned 24-hours a day and has the responsibility of monitoring and controlling the CRA which includes, in addition to the water facilities, high-voltage transmission lines, electrical switchyards and other electrical power equipment. The DCC also has the responsibility of the scheduling of energy used for the CRA pumping.

At the present time the DCC does not have the capability to obtain real-time information of the CRA status for monitoring and control of water movement. The dispatchers at the DCC rely solely on telephone communications with each pumping plant for status of the pump units and canal, and with the control centers of Southern California Edison Company and Western Area Power Administration for the status of Metropolitan's 230-KV system. The lack of real-time information after a system occurrence or outages often hinders the resumption of the CRA operation, which then impacts the reliability of the supply of the Colorado river water.

A consultant specializing in Supervisory Control and Data Acquisition System (SCADA) systems, Macro Corporation (Macro), was hired to prepare a SCADA feasibility study for the CRA. After extensive in-depth investigations and evaluations, the study concluded that a SCADA system is needed and that it would greatly benefit and enhance the operations of the CRA. A total of 843 monitoring and control data points were identified. One of the major benefits would be the improvement of overall system reliability, as the SCADA system would provide real-time information for operating visibility

and decisions, emergency response and safety, and control of water movement. The other major benefits due to the information provided by the SCADA System would include additional purchase power costs savings, reduced operation and maintenance (O&M) costs, and reduced replacements water costs. These potential cost savings were estimated at upwards to $500,000/year. By far, the most important benefits are the enhancement of the CRA reliability and safety. The Peer Review Group also recommended this SCADA project and basically concurred with the conclusion of the feasibility study that the benefits to the CRA operations outweigh the cost requirements.

Macro's cost estimate for this project in 1992 dollars is $5,670,000 including a 15 percent contingency. This project was included in the Fiscal Year 1993/94 capital program budget request, and the estimates were escalated by five percent per year during implementation, bringing the total estimated cost to $6,576,000. A breakdown of the cost estimates is shown on the attached financial statement.

Macro suggested that the SCADA system be implemented in two phases. The bulk of the project cost would be in Phase I which includes development of procurement specification, bid evaluations, contract negotiations, the installation of all the SCADA hardware, and initial start-up and engineering requirements. Phase I would permit monitoring of all the data points and limited flow control at all pumping plants. Phase II implementation work would be less engineering intensive since all SCADA system hardware would have been installed. Phase II would permit control of high-voltage circuit breakers at all pumping plants and additional monitoring points for the power lines.

The approximate time periods as estimated by Macro for the implementation of this project are as follows:

-	Specification, Bidding, and Proposal Evaluation	11 months
-	Contractor's Project Implementation	12 months
-	Phase I Installation and Start Up	5 months
	Subtotal	28 months
-	Phase II Installation and Start up	10 months
	Total	38 months

Although Macro is recommending that the SCADA system be implemented in two phases, the project contains the flexibility to be spread out and implemented in a number of phases. In the development of the project specification, the implementation stages and the number of phases would be further identified.

The proposed actions are exempt from the provision of the California Environment Quality Act because it involves improvements to existing facilities.

Board Committee Assignments

This letter is referred for action to:

The Engineering and Operations Committee pursuant to Section 2431 (c) of Metropolitan's Administrative Code granting it authority to study, advise, and make recommendations with regard to facilities for the delivery of water and power; and for the distribution of electrical energy to the aqueduct pumping plants; and

The Finance and Insurance Committee because of its authority to study, advise, and make recommendations with regard to authorization of appropriations pursuant to Administrative Code Section 2441 (d).

Recommendation

It is recommended that the Board appropriate $6,576,000 from the Pay-As-You-Go Fund to finance the estimated costs for the installation of a Supervisory Control And Data Acquisition System for the water and power operations of the Colorado River Aqueduct Pumping System.

John R. Wodraska

AHC:dd

Attachment

Attachment

Financial Statement
(Program No. 5-0139-11)

Labor and Additives	$1,587,600
Materials and Supplies	2,849,500
Administrative Overhead	876,400
Contingencies	849,400
Professional Services & Misc.	413,100
Total	$6,576,000

Projected Expenditure of Funds:

Through Fiscal Year 1992/1993	62,800
Fiscal Year 1993/1994	249,800
Fiscal Years 1994/1996	$6,263,400
Total	$6,576,000

Source of Funds: Pay-As-You-Go

Class One: Project directly related to delivery of water which, if delayed, will adversely impact reliability of service.

Project Benefit: This program will provide operational improvements and reliability of the water and power operations of the CRA system.