THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Engineering and Operations Committee

1/12/2010 Board Meeting

8-3

Subject

Appropriate $8.1 million; award $5,181,000 contract to Southern Contracting Company; and authorize agreement with Marrs Services, Inc. for fault current protection upgrades at the Colorado River Aqueduct pumping plants (Approp. 15438)

Description

This action authorizes construction of fault current protection upgrades at Metropolitan's five Colorado River Aqueduct (CRA) pumping plant switch houses. These upgrades are needed to protect the CRA pumping plants in the event of a short circuit in any of the pump motors. The motor circuits are presently vulnerable to higher fault-current levels than they were originally designed to withstand.

Timing and Urgency

There is a significant risk that in the event of a short circuit, the pump motor circuits could fail and possibly cause a prolonged outage of the CRA. The CRA is a critical regional water supply facility, and it is imperative that this project move forward to improve system reliability.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and staff recommends moving forward at this time due to the critical nature of these facilities. This project is categorized as an Infrastructure Upgrade project and is budgeted within Metropolitan's CIP for fiscal year 2009/10.

Background

The switch houses at each of the five CRA pumping plants contain circuit breakers, switches, and electrical bus bars that are used to safely start and stop the main pump motors, as well as to protect equipment from damage in the event of a short circuit. When the switch houses were constructed in the 1930s, the equipment was sized to withstand 70,000 amps of momentary fault current. This capacity was sufficient to handle fault currents which might be generated by internal sources, along with the external contribution from Hoover Dam. However, since that time, numerous transmission lines and generating plants have been constructed near the CRA transmission system. Due to Metropolitan's integration into this expanded regional power grid, the CRA has become exposed to a larger number and greater magnitude of external sources of fault current.

Staff has determined that the potential fault currents now exceed the original 1930s rated capacity of the switch houses at four CRA pumping plants (Intake, Gene, Eagle Mountain, and Hinds). Using modern electrical standards, the potential fault currents also exceed the capacity of the bus bars at all five CRA pumping plants. In the event of a short circuit, the motor circuits could be overloaded and equipment could fail, possibly causing damage in the switch house, injury to staff, and a prolonged outage of the CRA.

Pumping Plant Switch House Fault Current Protection – Construction ($8,100,000)

In June 2009, Metropolitan's Board authorized final design and equipment procurement for upgrades to the five CRA pumping plants in order to provide safe fault current protection for the pump motor circuits. Planned upgrades at the pumping plants include two principal items: (a) installation of a total of 18 current-limiting

reactors, (six each at Hinds, Eagle Mountain and Gene pumping plants), which will reduce the fault currents in the switch houses to below the existing rated capacity of the motor circuit breakers; and (b) upgrades to the copper bus bars at all five switch houses, including replacement of 150 weak sections of bus bars and installation of hundreds of additional supports and stiffeners for existing bus bars to withstand potential fault currents. These improvements will enhance safe and reliable pumping plant operation. The current-limiting reactors are presently being fabricated and are scheduled to be delivered in February 2010. Major construction, including installation of the reactors and upgrades in the switch houses, is scheduled to take place during two shutdowns planned for April 2010 and February 2011.

Specifications No. 1667A for the CRA Pumping Plant Fault Current Protection Upgrades was advertised for bids on November 2, 2009. As shown in **Attachment 2**, two bids were received and opened on December 7, 2009. The low bid from Southern Contracting Company, in the amount of $5,181,000, complies with the requirements of the specifications. The other bid amount was $5,948,550, while the engineer's estimate was $5.6 million. For this contract, Metropolitan established a Small Business Enterprise (SBE) participation level of at least 20 percent of the bid amount. Southern Contracting Company has committed to meet this level of participation.

Two bids for this work were previously received on October 27, 2009. The low bid was deemed non-responsive because the bid took exceptions to contract terms and conditions. The second bid was significantly higher than the engineer's estimate. Following assessment of the bid results, staff amended the specifications to include an additional shutdown in order to encourage higher numbers of competitive bids.

This action appropriates $8.1 million and awards a $5,181,000 construction contract to Southern Contracting Company. In addition to the amount of the contract, the appropriated funds include $958,000 for Metropolitan force construction; $1,098,000 for construction inspection; $164,000 for submittals review and technical support by the design team; $103,000 for preparation of as-built drawings; $75,000 for hazardous materials testing; $281,000 for environmental monitoring and project management; and $240,000 in remaining budget. Submittals review, technical support, and preparation of as-built drawings will be performed by Metropolitan staff with assistance from Lee & Ro, Inc., as discussed below.

Construction inspection will be performed by Metropolitan staff with specialized assistance from Marrs Services, Inc., as discussed below. For this project, the anticipated cost of inspection is approximately 14.8 percent of the total construction cost. Engineering Services' goal for inspection of construction contracts greater than $3 million is 9 to 12 percent. Inspection costs exceed the goal because of the round-the-clock specialized inspection required for two 18-day CRA shutdowns, and due to the multiple remote locations and long travel times between sites.

Professional Services Agreements

To execute the CRA Pumping Plant Fault Current Protection Upgrades project, staff recommends that consultants provide specialized assistance in the areas of electrical inspection and follow-up design support.

Technical Support by Lee & Ro, Inc. (No Action Required)

Technical support during construction is recommended to be provided by the design consultant, Lee & Ro, Inc. As the Engineer of Record, Lee & Ro will review submittals, respond to requests for information, and advise inspection staff on technical issues as they may arise. Lee & Ro was selected through a competitive process via Request for Proposals No. 719, and the design was performed under a board-authorized agreement. For this agreement, Metropolitan has established an SBE participation level of 20 percent. No amendment to the existing Lee and Ro agreement is required for this work. The estimated cost for Lee and Ro's services is $68,000.

Specialized Inspection Support by Marrs Services, Inc. – New Agreement

Electrical inspection is recommended to be provided by Marrs Services, Inc. under a new professional services agreement. This support will include inspection of all electrical activities including specialized work such as the high voltage current-limiting reactor installation and the switch house bus upgrades. Marrs Services was selected through a competitive process to provide construction contract administration and inspection services via Request for Qualifications No. 826. For this agreement, Metropolitan has established an SBE participation level of 18 percent. Marrs Services has committed to meet this goal.

This action authorizes a professional services agreement with Marrs Services, Inc., in an amount not to exceed $520,000, to perform specialized inspection for the Pumping Plant Switch House Fault Current Protection project.

See **Attachment 1** for the Financial Statement, **Attachment 2** for the Abstract of Bids, and **Attachment 3** for the Location Map.

This project is consistent with Metropolitan's goals for sustainability by enhancing reliability of the existing CRA pumping plants in order to maintain reliable water deliveries in the future.

Project Milestones

February 2011 – Completion of CRA shutdown work

April 2011 – Completion of construction

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, minor alterations and replacement of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and

a. Appropriate $8.1 million;
b. Award $5,181,000 contract to Southern Contracting Company for fault current protection upgrades for the CRA pumping plant switch houses; and
c. Authorize agreement with Marrs Services, Inc., in an amount not to exceed $520,000, for specialized inspection support.

Fiscal Impact: $8.1 million in budgeted funds under Approp. 15438

Business Analysis: This option will protect the five CRA pumping plants in the event of a short circuit in any of the pump motors. The pumping plant motor circuits are presently exposed to higher fault-current levels than they can safely withstand. There is a significant risk that in the event of a short circuit, the pump motor circuits could fail, and possibly cause a prolonged outage of the CRA. This project will enhance CRA reliability, improve operational efficiency and workplace safety, and protect Metropolitan's assets.

Option #2

Do not award the construction contract and re-advertise in an attempt to receive more favorable bids.

Fiscal Impact: None

Business Analysis: This option may or may not result in more favorable bids and would defer the switch house fault current protection upgrades until other CRA shutdowns can be scheduled, further exposing the CRA pumping plants and staff to the risk of equipment failure.

Staff Recommendation

Option #1

12/29/2009
Roy L. Wolfe *Date*
Manager, Corporate Resources

12/29/2009
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement
Attachment 2 – Abstract of Bids
Attachment 3 – Location Map

Reference Number cr12602750

Financial Statement for CRA Reliability – Phase II Program

A breakdown of Board Action No. 7 for Appropriation No. 15438 for the Pumping Plant Switch House Fault Current Protection project* is as follows:

	Previous Total Appropriated Amount (Nov. 2009)	Current Board Action No. 7 (Jan. 2010)	New Total Appropriated Amount
Labor			
Studies and Investigations	$ 961,800	$ -	$ 961,800
Final Design	558,100	-	558,100
Owner Costs (Program mgmt., contract admin., envir. monitoring, as-builts)	872,690	429,000	1,301,690
Submittals review	-	126,000	126,000
Construction Inspection and Support	28,800	578,000	606,800
Metropolitan Force Construction	53,300	881,000	934,300
Materials and Supplies	1,495,405	68,000	1,563,405
Incidental Expenses	46,400	9,000	55,400
Professional/Technical Services	532,000	-	532,000
Lee & Ro, Inc.	-	68,000	68,000
Marrs Services, Inc.	-	520,000	520,000
Equipment Use	-	-	-
Contracts	-	5,181,000	5,181,000
Remaining Budget	543,505	240,000	783,505
Total	**$ 5,092,000**	**$ 8,100,000**	**$ 13,192,000**

Funding Request

Program Name:	CRA Reliability – Phase II Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15438	**Board Action No.:**	7
Requested Amount:	**$** 8,100,000	**Capital Program No.:**	15438-I
Total Appropriated Amount:	**$** 13,192,000	**Capital Program Page No.:**	283
Total Program Estimate:	**$** 25,350,000	**Program Goal:**	I-Infrastructure Reliability

* The total amount expended to date on the Pump Plant Switch House Fault Protection Project is approx. $816,000.

The Metropolitan Water District of Southern California

Abstract of Bids Received on December 7, 2009 at 2:00 P.M.

Specifications No. 1667A

230kV Line Reactors and 6.9kV Switch Houses

This contract consists of installation of eighteen 230kV air core line reactors with transient recovery voltage capacitors, 6 each at Gene, Eagle Mountain, and Hinds pumping plants, and upgrades to the 6.9kV switch house bus bars at all five Colorado River Aqueduct pumping plants.

Engineer's estimate: $5,600,000

Bidder and Location	Total	SBE $	SBE %	Met SBE[1]
Southern Contracting Company, San Marcos, CA	**$ 5,181,000**	**$1,036,200**	**20%**	**Yes**
NAES Power Contractors, Inc., Hillsboro, OR	$ 5,948,550	N/A	N/A	N/A

[1] SBE (Small Business Enterprise) participation set at 20 percent

Location Map