



- Board of Directors
Engineering and Operations Committee

7/12/2011 Board Meeting

7-3

Subject

Appropriate \$170,000; and authorize final design to replace the data center uninterruptible power supply at Metropolitan's Headquarters Building (Approp. 15376)

Description

This action authorizes final design to replace the Uninterruptible Power Supply (UPS) in the data center at Metropolitan's Headquarters Building. The replacement system will protect the data center from power disruption and equipment failure due to power spikes or surges.

Timing and Urgency

The existing 12-year-old UPS at Metropolitan's Headquarters Building has reached the end of its service life and is losing reliability. The UPS system's main function is to prevent fluctuations in electric power that could cause equipment failures, and to serve as a backup power supply in the event of loss of utility power. A UPS system differs from an emergency standby generator in that it provides near instantaneous power during the interim period prior to the standby generator coming online, or until its connected equipment is properly shut down. Replacement of the UPS is required to reduce the potential for service disruption, loss of critical data, or damage to Metropolitan's data systems, which support financial operations, emergency response, communications, water operations, and engineering functions.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Upgrade project. This project is budgeted within Metropolitan's CIP for fiscal year 2011/12.

Background

Metropolitan's data center, which was constructed in 1998, is housed in a 4,000-square-foot area at the Union Station Headquarters Building in Los Angeles. The data center acts as Metropolitan's centralized repository for data processing, storage, and network communications for key systems such as:

- Financial – Water billing, which calculates customer water usage and produces bills
- Emergency Response – Two-way radio system
- Water Operations – Supervisory Control & Data Acquisition (SCADA) and Automated Meter Reading (AMR) systems, which are used to control and meter water deliveries throughout Metropolitan's service area
- Water Quality – Laboratory Information Management System (LIMS) that is used to manage and track the water sampling and testing process
- Engineering – Programs that monitor and measure seepage and displacement of dams

Many of these systems run 24 hours per day, 7 days per week, and therefore have a required return-to-service time from immediate to within the first two hours of utility power loss.

The UPS is a critical component of the data center, and is located in its own room within the data center. It continuously protects computers, servers, network storage devices, telecommunications equipment, and other electronic devices from power disruption such as power surges or spikes, which could cause damage to equipment, including loss of critical data. The UPS also provides emergency electrical power when utility power is lost. It allows time for crucial systems to be correctly powered down until the emergency generator can be activated.

UPS systems typically have a service life of 10-13 years. The data center's current UPS is 12 years old. Although the equipment has generally performed well, it is nearing the end of its service life and is losing its reliability.

Metropolitan has a long-term need for its data center to run applications onsite and to serve as a hub for its voice and data network connections/equipment. While some of the applications will migrate to the Internet "cloud" over time, other critical systems will continue to be housed in the data center over the long-term due to a number of corporate needs, such as information security. Metropolitan has approximately 50 major applications (e.g., SCADA, LIMS, Water Billing System, Email, Payroll, Maximo Maintenance Management, etc.) at the present time. This number is expected to grow to meet future business needs identified in the Information Technology Strategic Plan. As a result, there will be a continued need to maintain critical equipment in the data center over the next 10 years at a minimum.

In September 2010, Metropolitan's Board authorized preliminary design phase activities to replace the Headquarters data center's UPS with a new system featuring built-in redundancies. The new UPS system will consist of parallel individual plug-in power and battery modules that can be stacked on top of each other inside the UPS frame. The new system will be more efficient and allow for future expansion. Preliminary design is now complete and staff recommends moving forward with final design of the new UPS system at this time.

Uninterruptible Power Supply System Replacement – Final Design Phase (\$170,000)

The scope of the UPS upgrade will include installation of a new UPS system that will fit into the existing UPS room. However, due to differing layouts, the new equipment will require electrical conduits and cables to be rerouted and the existing sub-floor steel frames to be modified. In addition, the air conditioning ductwork of the larger data center will be modified to improve its air circulation and to provide backup cooling for the UPS room. The redundancy of cooling systems at the UPS room is necessary as a backup in case of failure or scheduled maintenance of the single existing air conditioning system. A temporary system will also be installed to sustain the UPS functions while the new system is being constructed and tested.

Final design phase activities will include preparation of drawings and specifications, acquisition of permits from the city of Los Angeles, planning for power and equipment shutdowns, development of a construction cost estimate, advertisement and receipt of bids, and all other activities in advance of award of a construction contract. Staff will return to the Board at a later date for award of the contract.

This action appropriates \$170,000 and authorizes final design of improvements to the UPS system in the Headquarters Building's data center. Requested funds include \$87,600 for final design; \$31,200 for project management and shutdown planning; \$27,200 for permitting, advertisement, and receipt of bids; and \$24,000 for remaining budget. The anticipated cost of final design is approximately 14.6 percent of the estimated construction cost. Engineering Services' goal for design of projects with construction cost less than \$3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from \$500,000 to \$600,000. All final design activities will be performed by Metropolitan staff.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2011/12 capital budget. See [Attachment 1](#) for the Financial Statements, and [Attachment 2](#) for the Location Map.

This project is included within capital Appropriation No. 15376, the Information Technology System – Infrastructure Program, which was initiated in fiscal year 2001/02. Appropriation No. 15376 also includes projects such as the Two-Way Radio, Phase II; IT Network, Phase II; Enterprise Infrastructure Upgrade; IT Recovery Facility Environmental Upgrades; Telephone System Replacement; and the Exchange 2007

Upgrade. With the present action, the total funding for Appropriation No. 15376 will increase from \$35,311,000 to \$35,481,000.

This project is consistent with Metropolitan's goals for sustainability by enhancing reliability of the UPS system to maintain reliable equipment during emergencies.

Project Milestone

February 2012 – Completion of final design

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

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 proposed action involves the funding, design, and minor alterations, reconstruction or replacement of existing public facilities along with the construction of minor appurtenant structures with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 2, and Class 3 Categorical Exemptions (Sections 15301, 15302, and 15303 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; and Class 3, Section 15303 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination and

- a. Appropriate \$170,000; and
- b. Authorize final design to replace the data center UPS system at Metropolitan's Headquarters Building.

Fiscal Impact: \$170,000 of budgeted funds under Appropriation No. 15376

Business Analysis: This project will enhance reliability of the data center UPS system, which is used to protect computers, servers, and telecommunications equipment at Metropolitan's Headquarters Building.

Option #2

Do not proceed with final design at this time.

Fiscal Impact: None

Business Analysis: This option will forgo an opportunity to improve reliability of the data center UPS system at Metropolitan's Headquarters Building, which would increase the risk of loss of critical data, damage to equipment, and associated interruptions in operation of key applications.

Staff Recommendation

Option #1


Gordon Johnson
Manager/Chief Engineer,
Engineering Services

6/20/2011

Date


Jeffrey Kightlinger
General Manager

6/23/2011

Date

[Attachment 1 – Financial Statement](#)

[Attachment 2 – Location Map](#)

Ref# es12611304

Financial Statement for ITSP Infrastructure Program

A breakdown of Board Action No. 14 for Appropriation No. 15376 for preliminary design of the Headquarters Data Center Uninterruptible Power Supply System* is as follows:

	Previous Total Appropriated Amount (Oct 2010)**	Current Board Action No. 14 (July 2011)	New Total Appropriated Amount
Labor	\$ 16,115,931	\$ -	\$ 16,115,931
Studies & Investigations	97,500	-	97,500
Final Design	-	87,600	87,600
Owner Costs (Program mgmt., permitting, shutdown planning)	52,500	50,400	102,900
Construction Inspection & Support	-	-	-
Metropolitan Force Construction	-	-	-
Materials & Supplies	11,401,989	-	11,401,989
Incidental Expenses	151,493	8,000	159,493
Professional/Technical Services	5,499,608	-	5,499,608
Equipment Use	43,231	-	43,231
Contracts	269,266	-	269,266
Remaining Budget	1,679,482 ***	24,000	1,703,482
Total	\$ 35,311,000	\$ 170,000	\$ 35,481,000

Funding Request

Program Name:	ITSP Infrastructure Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15376	Board Action No.:	14
Requested Amount:	\$ 170,000	Capital Program No.:	15376-I
Total Appropriated Amount:	\$ 35,481,000	Capital Program Page No.:	298
Total Program Estimate:	\$ 46,983,000	Program Goal:	Reliability & Efficiency

* The total amount expended to date on the Headquarters Data Center Uninterruptible Power Supply System project is approximately \$124,900.

** This column corrects an administrative error from Board Action No. 13.

*** Reflects reallocation of \$480,000 from remaining budget for the Enterprise Infrastructure, Two-Way Radio, Union Station Headquarters Technical Upgrade, and Exchange Upgrade projects; and reallocation of \$215 from projects completed under budget to Remaining Budget.

Distribution System

