

City of Culver City, California
City Council Agenda Item Report

Meeting Date: 08/08/05		Item Number: <u>C-5</u>	
AGENDA ITEM: Approval to Purchase Replacement Uninterruptible Power Supply for City Hall Data Center from Power Design of Irvine, CA			
Contact Person/Dept.: David Leuck		Phone Number: (310) 253-5961	
Fiscal Impact: Yes ☒ No ☐		General Fund: Yes ☒ No ☐	
Public Hearing: ☐		Action Item: ☒ Attachments: ☒	
Public Notification: Power Design (Curt Vikan 7/21/05), Master Notification List 8/3/05			
Department Approval: John Richo 7/28/05		CAO Approval: Jerry Fulwood 8/3/05	
City Controller Approval: Marlee Chang 8/3/05			
<u>RECOMMENDATION:</u> That the City Council approves the purchase of an uninterruptible replacement power supply for the City Hall Data Center from Power Design. <u>BACKGROUND:</u> The City Hall Data Center houses the majority of the City's computer servers and other critical infrastructure devices. As built the Data Center power protection scheme was obsolete. Designed in 1993 and completed in 1995 it was designed for a Mini/Mainframe computing environment. In 1995 the City had one Mini-Computer and 4 servers. The Mini/Mainframe environment no longer exists at the City; we have transitioned to a client-server environment which requires many powerful computers. The City's move to client-server based systems was in response to requirements for specialized application software that had to be shared within departments or across the City. Examples such as Finance, Payroll, Timekeeping, Permits, Refuse Accounting, Internet access, and E-mail name a few of the services needed. In general most specialized applications have been developed for client-server environments and are rarely available for Mini/Mainframe environments. Our transition to client-server began prior to the move in to the New City Hall and accelerated in 1997. The 1995 battery system was replaced with the present Uninterruptible Power Supply (UPS) in 2001 and has served with no problems; except the Data Center's power needs have outgrown the present unit. IT experienced the negative effect of operating at this level in early June 2005 when a vacuum cleaner was plugged into a UPS outlet. The power draw overloaded the unit and all the servers and devices in the Data Center powered off when the UPS shut down. All City computer related business was interrupted until all the devices could be restarted.			

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As the number of applications and services have expanded the amount of hardware and devices required to support them has expanded as well. Over the last 5 years the trend has continued as follows:

Servers by Year

2001	2002	2003	2004	2005
25	44	49	53	56

Entering the 2005-2006 budget year IT is expecting the number to expand to 58-60.

DISCUSSION:

If no UPS is present when there is any type of power event (blackout, brownout, power drop, or power surge) the problem is passed directly to the devices plugged into the power distribution system. Computer equipment (particularly servers) is sensitive to power issues and performs best when power is conditioned through a battery system. This enhances reliability day to day, and extends the life of the electronics. During normal operations the UPS acts as a power conditioner. Troughs and spikes in Edison's power flow are intercepted and smoothed before they can have an impact on the City's servers.

The existing UPS unit was made by American Power Conversion (APC) and has a maximum rating of 16 KVA (Kilo Volt Amps). Currently it is at 92-95% of capacity and as a stopgap measure IT is plugging non-critical servers into under desk style UPS units to avoid overloading the primary UPS. The existing unit cannot be increased in capacity. Space and technical considerations make adding a second unit to the room impractical.

Technical Considerations:

In an ideal world 1 KVA is equal to 1 KW (Kilo (thousand) Watts). That's a 1 to 1 efficiency power factor. Electronic devices and conditions such as magnetic interference can lower the efficiency of power delivery. Out of phase displacement can lower the transfer as low as 90%. This means that a system that is rated for 16 KVA could deliver less power before reaching maximum capacity. Computer power and computer devices consume power based on how intensely they are working and their maximum ratings. Typically a server in 2001 would have one or two power supplies consuming 250 to 300 Watts. Today power supplies are typically in the 400 Watt range and most significant servers have dual supplies for higher reliability. As IT phases out older servers for units with 400 Watt power supplies only about 40 single power supply units could be supported by a 16KVA UPS system if they were working at full power draw.

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Power for the Data Center comes from two sources:

- 16 KVA UPS system
- Generator backed power outlet (one standard 120 volt outlet circuit)

In a power outage situation the Data Center loses line power and after a period of time the generator at the Police Department supplies power until Edison power is restored. During the intervening time between failure and generator supplied power the UPS system acts as a battery allowing all servers to remain on and functioning.

One feature of modern large scale UPS units is the ability to program attached servers to power down as the batteries run down. The proposed unit has such ability. As the batteries are used servers will be programmed to shut down to allow remaining servers with more critical functions to remain up and running. For example E-Mail, Finance, and Web based services will stay up while less critical services shut down. In 2001 planned and unplanned blackouts lasted from 1 to 2 hours. The planned unit will support critical servers for up to 2 hours. Except for an extended failure the generator should be up and running prior to the batteries being drained. If the batteries are nearing empty the unit will execute a controlled shutdown of the remaining servers.

Vendor Selection:

In April 2005 IT solicited bids and suggestions from three APC partner companies (En Pointe, Avnet, and Power Design). The request was to replace with a unit that could support 30 KVA (approximately double) and have some additional room for growth. The anticipated cost of the best solution was in excess of \$20,000 which made a formal RFP necessary. A formal RFP bid process was initiated through the City's Purchasing Department. Maintenance Manager Heustace Lewis assisted with creating a generic description of the desired unit and the process opened to all manufacturers' products.

The bid was advertised in the May 26, 2005 Culver City News, advertised on the City's web site, and packages were mailed to the three companies that had assisted in the research process. Seventeen (17) additional bid packages were downloaded by interested parties. Three companies attended a walkthrough and question & answer session on June 14, 2005

Power Design submitted the only response to the City Clerk's office per the published bid requirements which closed at 3:00 PM on June 28, 2005. The bid response is Attachment 1.

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Transfer of Existing UPS:

The existing 16 KVA unit will be transferred to the Culver City Fire Department to fulfill an existing need for uninterrupted power for use in the update of the Emergency Operations Center/Alternate 911 Dispatch Center project. Reliable power delivery is an identified need within the project. This frees grant funds for the Fire Department that would otherwise be spent on acquiring their own UPS unit. At the conclusion of the EOC project the Fire Department will determine if there are any funds remaining to draw down and make a payment to the Computer Replacement Fund in recognition of the value transferred to the project.

FISCAL ANALYSIS:

In the initial research phase in April 2005 Avnet, En Pointe, and Power Design all quoted the solution which became the basis of the RFP. At that time Power Design was the low bidder of the three.

Power Design's response was for \$52,221 with an option to increase the capacity to 40 KVA for \$3,247. The first year's maintenance is included in the unit's cost.

Funding for this purchase is contained in Computer Replacement Fund (30724100).

ATTACHMENTS:

Attachment 1: Power Design Bid response to Bid 1306

MOTION:

That the City Council:

1. Approve the purchase of a replacement power supply from Power Design for \$55,468 from fund Computer Replacement Fund 30724100;
2. Authorize the City Attorney to draw up any required documents or contracts;
3. Authorize the Chief Administrative Officer to sign any required documents;
4. Authorize the Information Technology Director to approve a maintenance contract on the unit during its working life.