



**Operations Monitoring Report  
Third Quarter FY10**

**Prepared by:**

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## **I. Executive Summary**

A review of the fiscal year 2010 (FY10) Third Quarter performance and contract obligations between Constellation Energy Projects and Services (CEPS) and the Metropolitan Government of Nashville and Davidson County (Metro) is presented in this report by Thermal Engineering Group, Inc (TEG). The status of the available funds for all active capital construction and repair and improvement projects are also presented. For the fiscal year 2010, CEPS has satisfactorily met all of the contract obligations to Metro and has had no contract violations.

For the Third Quarter FY10, the chilled water sendout decreased by approximately 7.2% over the previous Third Quarter (FY09), and the sales decreased by approximately 13.7%. There were no cooling degree days in the Third Quarter FY10 and only 7 cooling degree days in the Third Quarter FY09. The peak chilled water demand for the current quarter is 8,900 tons with a cooling load factor for the quarter of approximately 42%. Chilled water sales have continued to decline each quarter since the First Quarter FY08.

The steam sendout is approximately 9.4% higher this quarter than the previous Third Quarter. Steam sales have increased approximately 10.4% over the previous Third Quarter. This Third Quarter saw a marked increase in heating degree days (23% increase) over the previous Third Quarter. Steam system losses were approximately 8.6% of the sendout which was approximately 9.5% lower than in the previous Third Quarter. The peak steam demand for the current quarter is 121,500 pounds per hour, which represents an approximate 4% decrease from the previous Third Quarter. The heating load factor for the quarter is approximately 53%.

The Energy Generating Facility (EGF) performance continues to surpass the System Performance Guarantee (Guaranteed Maximum Quantity or GMQ) levels. The chilled water and steam plant electric consumptions continue to perform considerably lower than the guaranteed levels. The steam plant fuel efficiency decreased marginally from the previous Third Quarter. The total water consumption for the steam and chilled water plants has decreased approximately 6% from the previous Third Quarter. The chilled water EDS make-up has increased by approximately 71% with decreases in all other water uses except steam.

Work continued on DES Capital and Repair & Improvement Projects during the Third Quarter of FY10. DES062 and DES075 were substantially completed during the Third Quarter FY10 with closeout expected in the Fourth Quarter FY10. Design was completed on four additional projects; DES067, DES068, DES069 and DES078 during the Third Quarter FY10. Bids were received on four projects; DES067, DES068, DES069 and DES078 during the Third Quarter FY10 and awards or selections were made on three projects; DES068, DES069 and DES078. Awards are anticipated to take place on DES067 during the Fourth Quarter FY10, as well as, the completion of the design, the bidding and award of DES076. Repair and Improvements to the EDS continue as scheduled.

The current fiscal year system operating costs were \$14,150,615 at the end of the Third Quarter. This value represents approximately 67.5% of the total budgeted operating cost for FY10. The customer revenues from the sales of steam and chilled water for the first half of FY10 were \$11,593,811 which is approximately 62.6% of the budgeted amount. The difference between the operating costs and customer revenue, the Metro funding amount (MFA), is \$2,556,804. This value is approximately 104.6% of budget due to the additional bond payments for the 2005B, 2007 and 2008 bonds.

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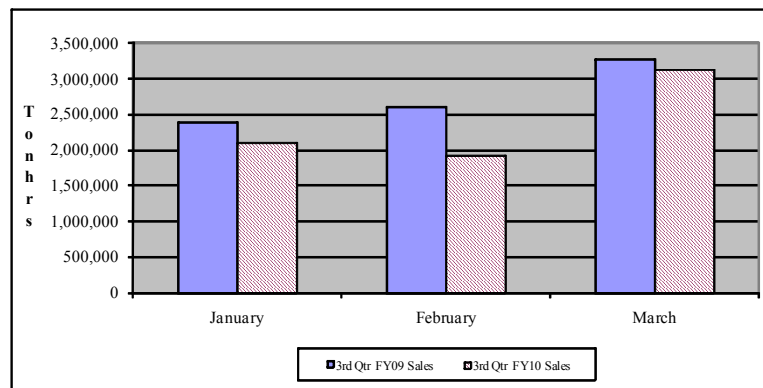
## II. Energy Distribution System Sales and Performance

This section of the report discusses and presents performance information regarding the operation of the EGF for the periods described. Charts and tabular data are also presented to provide a more detailed description of the actual EGF performance.

### A. Chilled Water

#### 1. Sales and Sendout

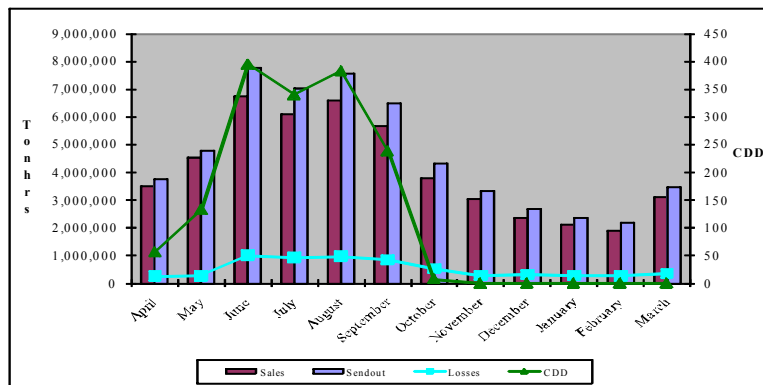
A comparison for the Third Quarter chilled water sales is shown in Figure 1. This data reflects a decrease in sales for the current quarter over the same quarter of the previous fiscal year. There were no cooling degree days this Third Quarter. The Third Quarter FY10 was markedly colder than in previous years.



**Figure 1. Second Quarter FY10 Chilled Water Sales Comparison**

The peak chilled water demand for the current quarter is 8,900 tons. The cooling load factor for the current quarter, relative to sendout, is approximately 42% and is 2% less than in the previous Third Quarter.

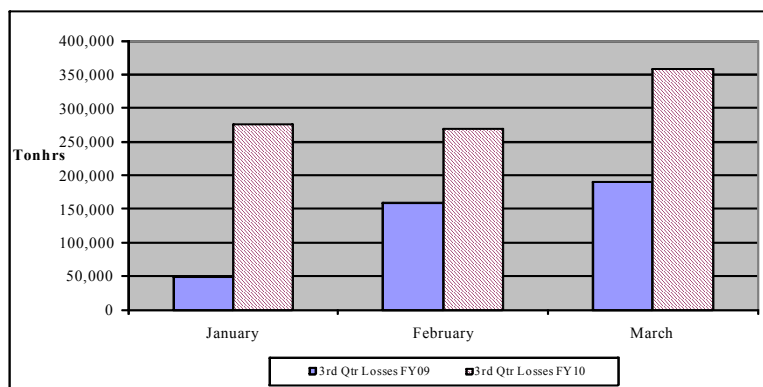
Figure 2 shows the chilled water sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in tonhrs per month between the recorded sendout and sales values and represent the total energy loss for chilled water in the EDS. The number of cooling degree days per month are also tracked for comparison.



**Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months**

## 2. Losses

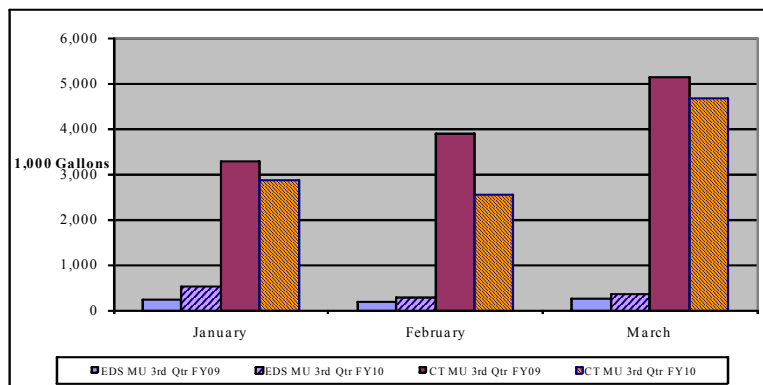
A comparison of the total, chilled water energy losses in the EDS for the Third Quarter is shown in Figure 3. These losses are the difference in chilled water sendout and sales. The energy loss is caused by a combination of the loss in the mass of chilled water and a net heat gain into the chilled water piping. The increase in supply temperature between the EGF and the customers is typically less than 1°F.



**Figure 3. Chilled Water System Loss Comparison for the Third Quarter FY10**

The EDS make-up increased by approximately 70.7% over the previous Third Quarter due to a suspected leak in the system. The total energy losses increased by approximately 126.6%. The make-up to the cooling towers decreased by approximately 18.1%. The number of cycles of concentration in the condensing

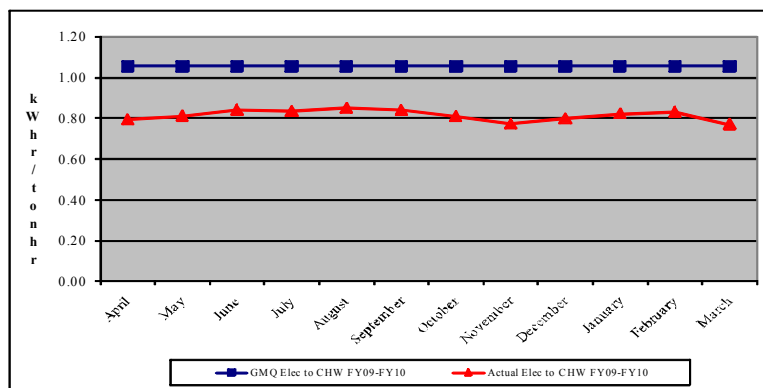
water circuit decreased marginally in the Third Quarter over the previous Third Quarter. The overall city water make-up comparison for the chilled water system is shown in Figure 4.



**Figure 4. Chilled Water System City Water Usage Comparison**

### 3. Performance

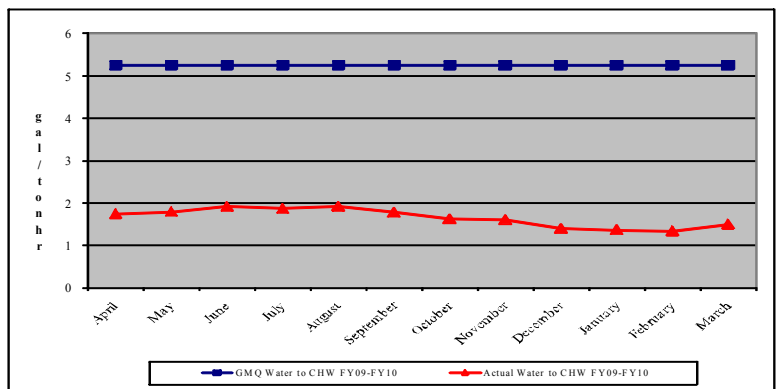
The performance of the chilled water aspect of the EGF is presented by the following two charts, Figures 5 and 6, for FY09-10. Under the management of CEPS, the System Performance Guarantee levels as described in the ARMA are being achieved quite satisfactorily.



**Figure 5. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months**

The chilled water allocation of the electric consumption falls under the GMQ limit of 1.055 kWhr per tonhr for the current quarter, and no excursion is reported for the current fiscal year. The electric usage for the current quarter decreased

approximately 8.9% over the Third Quarter for FY09. The actual chilled water plant water conversion factor is approximately 5.5% greater than in the previous Third Quarter. The total consumption of city water for the chiller plant for the current quarter is approximately 13.5% less than that for the previous Third Quarter.

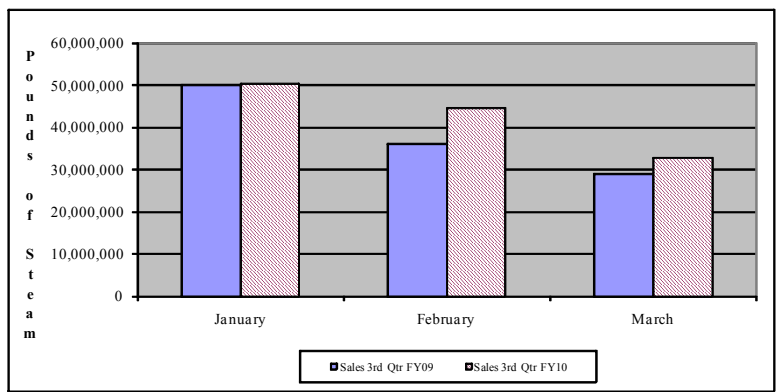


**Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months**

B. Steam

1. Sales and Sendout

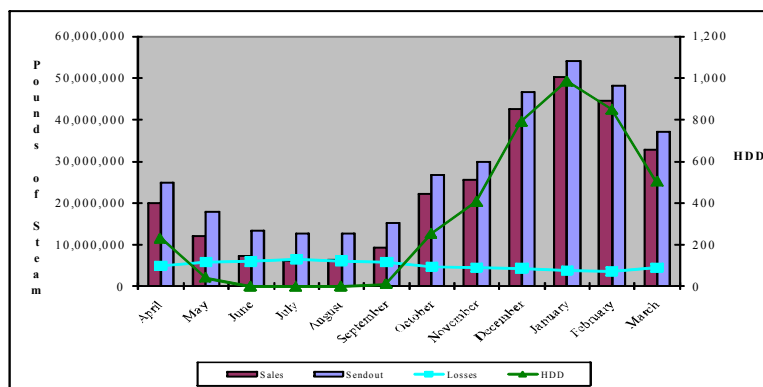
The steam sendout increased by approximately 9.3% over the previous Third Quarter (FY09), and the sales increased by approximately 10.4%. The steam system losses decreased marginally. The number of heating degree days increased by approximately 23.0% over the previous Third Quarter. A comparison for the Third Quarter steam sales is shown in Figure 7.



**Figure 7. Steam Sales Comparison for the Third Quarter FY10**



Figure 8 shows the steam sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in pounds per month between the recorded sendout and sales values and represent the total mass loss in the EDS between the EGF and the customer meters.

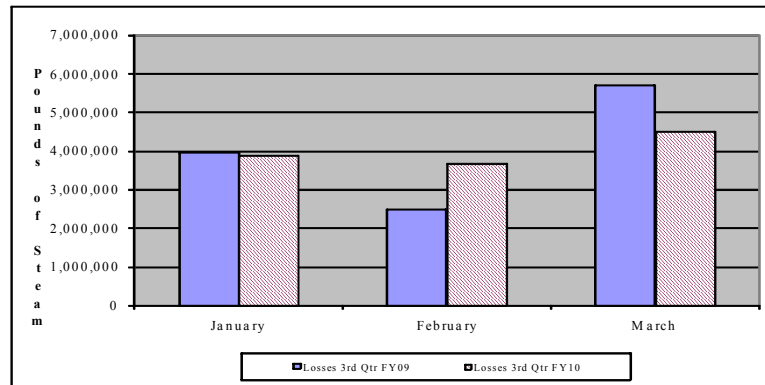


**Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months**

The peak steam demand for the current quarter is 121,500 pounds per hour, which is approximately 4.1% higher than the peak demand for the previous Third Quarter. The heating load factor for the current quarter, relative to sendout, is approximately 53% and represents an increase in the load factor over the previous Third Quarter of approximately 14.0%.

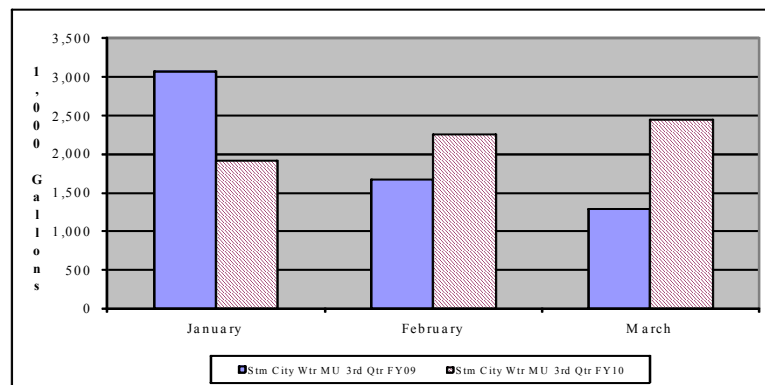
## 2. Losses

A comparison of the total steam mass losses in the EDS for the Third Quarter is shown in Figure 9. The mass loss is caused by the heat loss in the EDS between the EGF and the customer meters, resulting in a mass loss at steam traps. Faulty traps, steam leaks or meter error could also be a contributing cause of these losses. The total losses for the current quarter are approximately the same as in FY09.



**Figure 9. Third Quarter FY10 Steam System Losses**

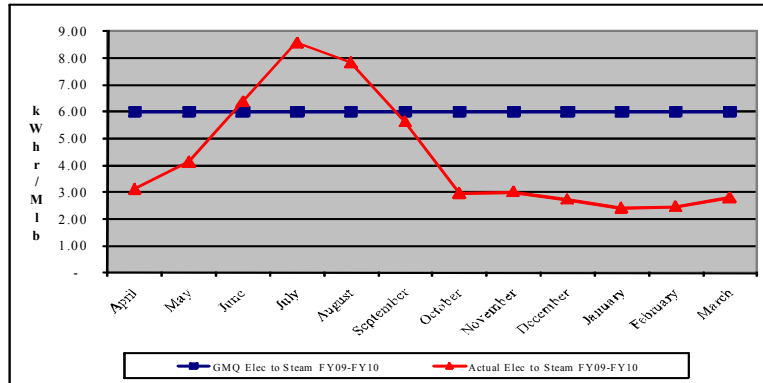
The amount of city water make-up (MU) to the steam system consists of the loss in mass between the EGF and the customers, in the condensate return from the customers to the EGF and losses at the EGF. This data is shown in the comparison of Third Quarter data in Figure 10. Figure 10 depicts an increase in city water make-up to the steam system of approximately 9.4% for the current quarter.



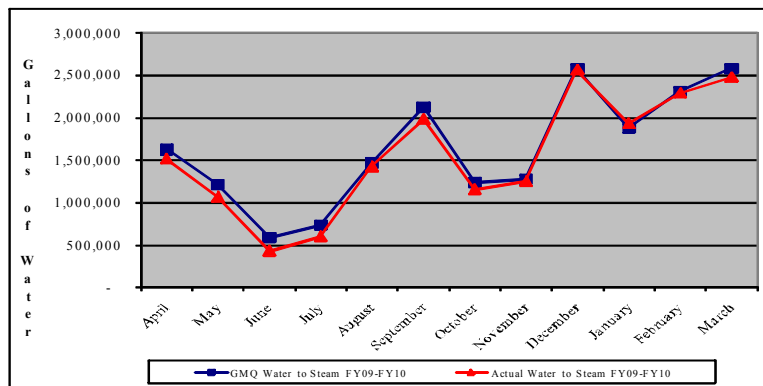
**Figure 10. Third Quarter FY10 Steam System City Water Make-up Comparison**

### 3. Performance

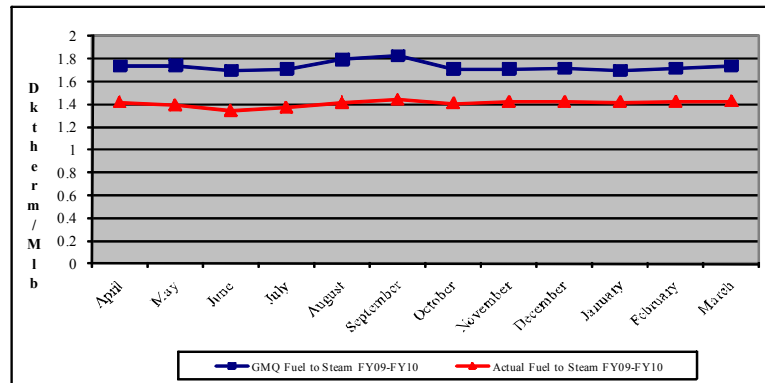
The performance of the steam system aspect of the EGF is presented by the following three charts, Figures 11, 12 and 13. Under the management of CEPS, the System Performance Guarantee levels as described in the ARMA are being achieved satisfactorily except for the occasional excursion in the electric consumption during the summer months.



**Figure 11. Steam Plant Electric Consumption Performance Guarantee Comparison for the Previous Twelve Months**



**Figure 12. Steam Plant Water Consumption Performance Guarantee for the Previous Twelve Months**



**Figure 13. Steam Plant Fuel Consumption Performance Guarantee for the Previous Twelve Months**

### C. Contract Guarantee Performance

The production and sales performance for the EGF and EDS are summarized in Table 1 for the current quarter. Additional parameters, such as cooling tower blowdown and peak demands are listed in this table, as well. Table 2 presents the Third Quarter comparison of the Guaranteed Maximum Quantities (GMQ) of the criteria commodities (fuel, water and electricity).

**Table 1. Third Quarter FY10 Production, Sales and Consumption Summary**

Item	Unit	Third Quarter FY10	Third Quarter FY09	*Percent Difference
	days	90	90	0.00%
<b>Total Electric Use</b>	kWhrs	6,045,308	6,569,295	-7.98%
Chilled Water	kWhrs	5,723,838	6,282,908	-8.90%
Steam	kWhrs	321,470	286,387	12.25%
<b>Total Water Use</b>	kgal	17,843	19,033	-6.25%
Total Chilled Water	kgal	11,227	12,983	-13.53%
EDS Make-up	kgal	1,147	672	70.68%
Cooling Towers	kgal	10,080	12,311	-18.12%
Calc CT Evaporation	kgal	8,600	10,511	-18.18%
CT Blowdown	kgal	1,480	1,800	-17.78%
Calc # Cycles		5.81	5.84	-0.49%
Steam	kgal	6,616	6,050	9.36%
<b>Total Fuel Use</b>	mmBTU	198,436	180,567	9.90%
Natural Gas	mmBTU	197,826	180,345	9.69%
Propane	mmBTU	610	222	N/A
<b>Condensate Return</b>	kgal	11,224	10,303	8.93%
	lbs	91,537,998	84,030,179	8.93%
Avg Temp	°F	162.0	159.7	1.46%
<b>Sendout</b>				
Chilled Water	tonhrs	8,046,100	8,673,600	-7.23%
Steam	lbs	139,512,000	127,599,000	9.34%
Peak CHW Demand	tons	8,900	9,400	-5.32%
Peak Steam Demand	lb/hr	121,500	126,625	-4.05%
CHW LF		41.85%	42.72%	-2.02%
Steam LF		53.16%	46.65%	13.95%
<b>Sales</b>				
Chilled Water	tonhrs	7,144,087	8,275,471	-13.67%
Steam	lbs	127,460,706	115,417,902	10.43%
<b>Losses</b>				
Chilled Water	tonhrs	902,013	398,129	126.56%
Steam	lbs	12,051,294	12,181,098	-1.07%
		8.64%	9.55%	-9.51%
<b>Degree Days</b>				
CDD		0	7	-100.00%
HDD		2,336	1,900	22.95%

\*positive percent difference values imply an increase from FY09 to FY10

**Table 2. Third Quarter FY10 Performance Guarantee Comparison for Steam and Chilled Water**

GMQ Calculations	Unit	Third Quarter FY10	Third Quarter FY09	*Percent Difference
<b>Steam</b>				
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00	
Electric Conversion	kWhr/Mlb	2.52	2.48	1.64%
GMQ Plant Efficiency	Dth/Mlb	1.718	1.715	
Plant Efficiency	Dth/Mlb	1.422	1.415	0.51%
Actual %CR		65.61%	65.85%	-0.37%
Avg CR Temp	°F	162	160	1.46%
GMQ Water Conversion	gal	6,764,482	6,143,338	
Water Conversion	gal	6,682,160	6,110,500	9.36%
<b>Chilled Water</b>				
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055	
Electric Conversion	kWhr/tonhr	0.801	0.759	5.53%
GMQ Water Conversion	gal/tonhr	5.25	5.25	
Water Conversion	gal/tonhr	1.57	1.57	0.17%

\*positive percent difference values imply an increase from FY09 to FY10

#### D. Operating Costs

The operating costs for the DES include the management fee to CEPS, debt service payments on the bonds and engineering and administration costs. Some of these costs are fixed, implying that they do not vary depending on the production or sales of steam or chilled water. The variable costs are dependent on the amounts of steam and chilled water produced and sold to the customers and include the utility and chemical treatment costs. The vast majority of the costs incurred for the operation of the DES are passed onto the customers in the form of the demand charges (fixed costs) and energy charges (variable costs). A summary of the total operating costs for the Third Quarter FY10 are shown in Table 3.

The revenues shown reflect the charges to the customers for their respective steam and chilled water service. The difference between the total costs and revenues from the customers is the shortfall that must be paid by Metro. The shortfall exists, in part, due to the remaining capacity at the EGF that was included in the original construction and remains unsold. This capacity is available for potential future customers.

The current fiscal year system operating costs were \$14,150,615 at the end of the Third Quarter. This value represents approximately 67.5% of the total budgeted operating cost for FY10. The customer revenues from the sales of steam and chilled water for the first three

quarters of FY10 were \$11,593,811 which is approximately 62.6% of the budgeted amount. The difference between the operating costs and customer revenue, the Metro funding amount (MFA), is approximately \$2,556,804. This value is approximately 104.6% of budget. At the time of this report, the CEPS invoice for their management fee of \$351,140 had been issued but not paid by Metro. Therefore, the “Reimbursed Management Fee” shown in Table 3 does not reflect this payment. The addition of this payment to Table 3 does not change the MFA.

**Table 3. FY10 Operating Expenses to End of Third Quarter**

Item	FY 10 Budget	Total Expenses to Date	Percent of FY10 Budget
FOC: Basic	\$ 3,976,200	\$ 2,889,128	72.66%
FOC: 9th Chiller	\$ 37,200	\$ 27,071	72.77%
FOC: Change Order 6A	\$ 73,400	\$ 53,447	72.82%
FOC: Change Order 6B	\$ 64,300	\$ 46,791	72.77%
Chemicals	\$ 161,200	\$ 111,886	69.41%
Engineering	\$ 26,200	\$ 7,434	28.37%
Insurance	\$ 43,700	\$ 27,723	63.44%
Marketing: CEPS Sales Activity	\$ 9,800	\$ -	0.00%
Metro Marketing	\$ 35,000	\$ 21,025	60.07%
Incentive Payments	\$ -	\$ -	n.a.
Project Administration	\$ 24,000	\$ -	0.00%
Metro Incremental Cost	\$ 526,400	\$ 292,995	55.66%
FEA: Steam	\$ -	\$ 111,102	n.a.
FEA: Chilled Water	\$ -	\$ 259,187	n.a.
ARFA	\$ -	\$ 41,960	n.a.
Metro Credit	\$ -	\$ (451,755)	n.a.
Water/Sewer	\$ 689,600	\$ 253,450	36.75%
Natural Gas/Propane	\$ 4,692,900	\$ 2,600,341	55.41%
Electricity	\$ 5,034,100	\$ 2,785,634	55.34%
EDS Repair & Improvement	\$ 176,500	\$ 140,085	79.37%
EDS Surcharge	\$ 70,600	\$ -	0.00%
<b>Sub-total Operations</b>	<b>\$ 15,641,100</b>	<b>\$ 9,217,505</b>	<b>58.93%</b>
2002 Bonds	\$ 4,362,900	\$ 3,272,129	75.00%
2005 Bonds	\$ 627,600	\$ 796,381	126.89%
FY07 Projects	\$ 227,800	\$ 448,300	196.80%
FY08 Projects	\$ 220,500	\$ 448,300	203.31%
Debt Service Interest Revenue	\$ (123,700)	\$ (32,000)	25.87%
Oper. Reserve Funding Deposit	\$ -	\$ -	n.a.
<b>Sub-total Debt Service</b>	<b>\$ 5,315,100</b>	<b>\$ 4,933,110</b>	<b>92.81%</b>
<b>Total Expenses</b>	<b>\$ 20,956,200</b>	<b>\$ 14,150,615</b>	<b>67.52%</b>
<b>Customer Revenues</b>	<b>\$ 18,512,100</b>	<b>\$ 11,593,811</b>	<b>62.63%</b>
<b>Total Metro Funding Amount</b>	<b>\$ 2,444,100</b>	<b>\$ 2,556,804</b>	<b>104.61%</b>

The DES serves 26 customers and 40 buildings in downtown Nashville. These customers are divided into three categories: 1) Private customers who privately own their buildings, 2) State of TN owned buildings and 3) Metro owned buildings. A summary of the annual costs

for each of these three categories is presented in Table 4. These values include late fees and penalties and any unpaid balances.

The previous tenant in the building at 401 Union Street is no longer a customer due to an abandonment of the premises. This building is currently owned by Metro but remains unoccupied and does not utilize any steam or chilled water. The former tenant and Metro have outstanding balances to DES that have not been collected to date. The revenue budgeted for this customer for FY10 will not be collected, thus the fixed cost component anticipated from this customer will not be paid, resulting in a potential increase in the MFA.

**Table 4. FY10 Customer Revenues to End of Third Quarter**

Building	Chilled Water			Steam		
	Total Cost	Consumption (tonhrs/yr)	Unit Cost (\$/tonhr)	Total Cost	Consumption (Mlb/yr)	Unit Cost (\$/Mlb)
Private Customers	\$ 2,511,398.36	11,414,951	\$ 0.2200	\$ 1,359,152.39	70,295	\$ 19.335
State Government	\$ 2,380,193.67	11,508,371	\$ 0.2068	\$ 1,841,650.95	92,587	\$ 19.891
Metro Government	\$ 2,183,862.79	11,781,523	\$ 0.1854	\$ 1,564,940.75	76,821	\$ 20.371
New Customers	\$ 821,206.51	3,706,978	\$ 0.2215	\$ 214,615.48	11,157	\$ 19.236
<b>Total</b>	<b>\$ 7,075,454.82</b>	<b>34,704,845</b>	<b>\$ 0.2039</b>	<b>\$ 4,765,744.09</b>	<b>239,704</b>	<b>\$ 19.882</b>

Total Revenue \$ 11,841,198.91  
 True-up and Adjustments \$ (247,387.89)  
 Net Revenue \$ 11,593,811.02

### III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CEPS for FY10. Communication between TEG and CEPS continues to be excellent, and CEPS has reported and managed all EGF operations satisfactorily and according to the ARMA with no contract violations.

#### A. Reliability

The principle issues surrounding the reliable operation of the EGF relates to the ability to operate without significant interruption, exclusive of planned outages, and disruption of service to the customers. The following disruptions in service occurred during the quarter.

- Water main breaks in the downtown area on January 9 caused the city water pressure at the EGF to drop to approximately 20 psig. This drop in water pressure caused a decrease in the steam sendout pressure from approximately 5:30 am until 8:00 am. Once Metro Water Services personnel were able to isolate the leaks, the city water pressure returned to normal; the steam pressure also returned to normal.
- A scheduled chilled water system outage occurred on January 23 from 1:00 am to approximately 12:04 am January 24. This outage occurred so that repairs on MH-M could be made.



- Several boiler trips occurred during February due to a faulty feedwater regulating valve. The boiler trips caused decreases in pressure below 150 psig but for never more than 30 minutes.
- One boiler trip occurred on March 24 due to a boiler feed pump trip. Another pump was restarted immediately. The boiler pressure dropped to 142 psig but returned to 152 psig within 45 minutes.

B. Efficiency

The operation of the EGF satisfied the guaranteed levels for all commodity usage during the quarter. There were no significant excursions above the guaranteed levels for the Third Quarter. A more detailed discussion of the contract guarantee performance was presented previously in this report.

C. Environment, Health and Safety

No environmental violations were reported during the quarter. There were no employees reported to be on light duty and were no reported lost-time accidents during the quarter.

Monthly safety meetings were conducted by HazMat, Inc. and through CEPS personnel.

D. Personnel

The EGF currently has twenty-five full time employees with one employee also working as the CEPS project manager. Of the current number of employees, nineteen were previously employed by Nashville Thermal Transfer Corporation. There were no personnel changes during the quarter.

E. Training

Staff training for this quarter consisted of the Health and Safety training discussed previously.

F. Water Treatment

The water treatment program consists of regular testing and monitoring of the water chemistry in the steam, chilled water and condensing water systems. Chemicals are added to control the water hardness, chlorine levels and biologicals. Remote testing of the condensate at the AA Birch, Tennessee Tower and the Andrew Jackson also occurs regularly to monitor the concentration and distribution of the steam system chemicals.

- Steam System
  - The steam and condensate system had excellent chemistry for most of the quarter with a few exceptions. The condensate return was relatively high for the quarter.
  - The amount of condensate return for March decreased due to contamination from several customers. The problem customers were isolated, and the condensate was sent to drain at these locations until the problems could be resolved.
  
- Condensing Water System
  - The conductivity of the condensing water continues to be normal with only a few excursions resulting in high cycles of concentration and low blowdown rates.
  
- Chilled Water System
  - The system control and chemistry continues to be excellent.

#### G. Maintenance and EGF Repairs

CEPS continues to report on the numerous routine maintenance and preventive maintenance activities performed on the EGF primary and ancillary equipment. The principle items are discussed herein as they relate to the repair, maintenance or replacement of equipment or devices at the facility and are not considered extraordinary. The cost for these items is included as part of the FOCs.

- A leak was repaired on the condenser water make-up line in January.
- The packing was replaced on boiler feedwater pump #3.
- The oil seals and bearings were replaced on boiler feedwater pump #1.
- Annual tube cleaning on the chillers continued during the quarter.
- Several temperature sensors on the chillers were replaced during the quarter.
- The boiler #3 mud drum blowdown valve was rebuilt.
- The boiler #3 feedwater regulating valve was repaired in March.
- Other minor repairs and maintenance were made during the quarter and are listed in the monthly reports issued by CEPS.

#### H. EGF Walk-through

A quarterly Walk-through of the EGF was performed on March 23, 2010, by Kevin Jacobs, P.E. of TEG. This review involved a tour of the facility with the primary points of interest and concern noted herein.

- Oil was noticed to have collected on the frame for CHP-2. Eddie Wisdom was informed about the presence of this oil. He responded that he believed the oil had been spilled from recent maintenance on the pump. There were no oil leaks noted.
- The operator log book indicated no recurring issues.
- Numerous minor cracks in the outside concrete walls remain. No additional work has been performed on these cracks. No action is required at this time.
- Empty cardboard boxes are being stored in the electrical room. This item was noted in the previous quarter's walk-through. These boxes should be removed.

#### **IV. Capital Projects**

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. Costs for these projects will be paid from funds already appropriated. New projects are anticipated for the 2010 Bond Projects, and some of these projects have been designed and bid. Due to the cost of the Tunnel Rock Rehabilitation project, two FY10 projects have been deferred until FY11.

The status of the projects are discussed, and the project cost-to-date and bond balances are also presented.

##### **A. Third Quarter FY10 Open Projects**

The following projects remained open at the end of the Third Quarter of FY10.

##### **1. DES033 - Manhole Lid and Ring Replacement/Restoration**

This project relates to the repair and replacement of manhole lids and rings whenever Metro Public Works performs street re-paving. No work was reported for this project during the Third Quarter FY10. This project will remain open.

##### **2. DES048 - Tunnel Lighting & Electrical Upgrades Phase III**

The first two phases of this project have been completed, and the final phase is budgeted and scheduled to be replaced during FY10. However, the repair to the tunnel structure needs to be completed prior to the lighting and electrical upgrades. Therefore, the completion of this project is on hold until DES067 is completed. DES 067 is tentatively scheduled to begin in the Fourth Quarter FY10.

3. DES060 - Manhole & Tunnel Insulation Repair (Revised from DES050 for FY10)

The work in Manholes 1, 2 and 3 was completed and accepted during the Third Quarter FY10. Closeout of the project work for these three manholes took place during the Third Quarter FY10. The work associated with this project will be ongoing as required.

4. DES062 - Steam and Condensate Replacement to 120 2<sup>nd</sup> Avenue North

The condensate service line to 120 2<sup>nd</sup> Ave. North (Wildhorse Saloon) has been out of service for several months. There is a small manhole in 1<sup>st</sup> Avenue North that the steam and condensate services pass through that contains a dripleg. This vault is in poor condition, and the replacement of the service piping to the Wildhorse offers the opportunity to eliminate this vault from service and avoid potential costly repairs. The design for the replacement of these service lines was completed during the First Quarter FY10. This project was bid and awarded during the Second Quarter FY10 and construction began during the same quarter.

Originally, completion of the work was scheduled for mid-December 2009. However, due to the discovery of unknown utilities, the pipe routing had to be redesigned. This redesign resulted in delays in the fabrication and delivery of the pre-insulated piping system. Even after these delays, piping was successfully installed into the Wildhorse, and the Riverfront Park sidewalk was temporarily patched prior to the Christmas holidays. The tie-in of the steam and condensate service took place during the Third Quarter. In addition, the restoration of the Riverfront Park sidewalk and additional work in Manhole K, including insulation, was completed during the Third Quarter FY10. This project should be closed out during the Fourth Quarter FY10.

5. DES063 - Manhole A, B & M Sump Pump Installation

Manholes A, B & M along First Avenue South experience significant amounts of groundwater infiltration and have to be pumped out frequently. During times of heavy rains, this water can accumulate quickly enough to submerge portions of the steam and trap piping resulting in boiling of this groundwater and heavy steaming of the vault. This project addresses the installation of sump pumps in these manholes to try and prevent the accumulation of groundwater. Design was completed and bids were received for this project during the Second Quarter FY10. However, the bids received were higher than anticipated, and an award was not made. Currently, TEG is evaluating methods to reduce the construction cost of this project to see if this project is viable.

6. DES066 - First Avenue Manhole Retirement

Manholes G, H and J along First Avenue North have not been in use for several years. These manholes are constructed of steel, and some of them are located in city streets. These manholes could potentially present a safety hazard if the structural integrity of these manholes were to decline to an unsafe condition. If this section of the distribution system were ever re-energized, the installation of new piping and manholes would be required.

These manholes were inspected during the Second Quarter FY10 and bids were received to fill them with flowable fill concrete. An award has been made, however due to unplanned repairs to downtown water mains, the city has not allowed the brief closure of 1<sup>st</sup> Avenue in order to fill the manholes in question with flowable fill. It is anticipated that the implementation of this project will take place during the Fourth Quarter FY10.

7. DES067 - EDS Tunnel Structural (Rock) Rehabilitation

This project was bid during the Third Quarter FY10. A contractor was recommended to CEPS for the completion of this work. Due to some questions regarding compensation for CEPS' management of this project, the project was not awarded during the Third Quarter FY10. A temporary solution to the compensation question was developed, and it is anticipated that a formal award and construction will begin during the Fourth Quarter FY10.

8. DES068 - Manhole 10 Structural Rehabilitation

The pavement above Manhole 10 has been buckling over the last few months. It was believed that this buckling occurred due to increased bus traffic from the newly opened bus station. Due to some cracking in some of the concrete roof beams inside this manhole, it was also thought that the manhole roof could be failing due to increased bus traffic. Upon further investigation, it was determined that the cracking was cosmetic and not structural. However, the pavement needed to be addressed. This project involves the construction of a concrete pad at street level above Manhole 10 to eliminate the pavement problem and to also divert the loading from the roof of the manhole. This project was designed and bid during the Third Quarter FY10. Construction is scheduled to begin and end during the Fourth Quarter FY10.

9. DES069 - Wildhorse Tempering Station Removal & Relocation to the Municipal Auditorium

A tempering station was installed in the Wildhorse Saloon in order to reduce the temperature of the condensate at the Wildhorse before it was sent to drain. This was necessary because the condensate return piping to the Wildhorse was no longer functional. Now that the Wildhorse piping has been replaced the tempering station is no longer needed.

During the implementation of project DES 055, the Rebuild of Manhole C, it was discovered that the condensate return piping from the Municipal Auditorium was clogged. Unable to remove this blockage, some bypass piping was installed to permit a future by-pass/tie-in of this line. However, the condensate at the Municipal Auditorium is currently being tempered with uncontrolled city water and sent to drain. This project addresses the removal of the tempering station at the Wildhorse and its relocation to the Municipal Auditorium. Design drawings were developed for this project and a contractor was selected for this work during the Third Quarter FY10. It is anticipated that this project will be completed during the Fourth Quarter FY10.

10. DES073 - MH 18 Platform Extension & Sump Pump Control Modifications

The controls for the Broadway, 4<sup>th</sup> Avenue and 7<sup>th</sup> Avenue Tunnel sump pumps are located in the eastern end of the Broadway Tunnel/Manhole 18. At times this area of the tunnel can become flooded and cause the sump pumps to trip. This presents problems because the sump pumps remove this accumulated water. This project extends the elevated platform in Manhole 18 to allow the relocation of the sump pump controls to a higher elevation thus eliminating electrical trips due to high water. The design drawings for this project were completed during the Third Quarter FY10. Due to the anticipated start of DES067 and the desire to avoid having two projects take place in the same location, at the same time, this project will be bid and awarded after the completion of DES067.

11. DES075 - 2010 Chilled Water Outage

There are two chilled water valves in Manhole M which used to isolate the original Nashville chiller plant on 1<sup>st</sup> Avenue. These valves were leaking chilled water into Manhole M which, along with groundwater infiltration, required pumping on a regular basis. The leaks on these valves were progressively getting worse. Based on this, a shutdown was conducted during the Third Quarter FY10 in order to remove these valves and eliminate the leaks. This work was performed on January 23-24,

2010. Cost substantiation was reviewed and accepted during the Third Quarter FY10. This project should be closed out during the Fourth Quarter FY10.

12. DES076 - Manhole S4A Rehabilitation

A steam leak was discovered in a manhole associated with the State steam system in January. CEPS personnel were not aware that this manhole was part of the State system. Through investigation and subsequent repair of the leak it was discovered that this manhole is in poor structural condition. The City of Nashville is only responsible for the maintenance/repair of the piping in this vault, thus meetings were held with State personnel to review the options available to make repairs to this structure. DES has both the methodology and the experience to make the required repairs, thus it was decided to have DES make these repairs and to be reimbursed for the expenditures through the monthly energy billing to the State.

Preliminary design was completed for the repairs during the Third Quarter FY10, however, the State requested that repairs not begin until June 2010. Therefore, this project will be bid and awarded during May 2010 and work will begin in June.

13. DES077 - Music City Center Service Connection

Preliminary engineering and a review of the service extension feasibility began on this project in FY09. This project includes the expansion of steam and chilled water service from the existing MH-B4 at Malloy and Almond Streets approximately 1,400 ft along 4<sup>th</sup> Avenue South and Demonbreun Street to the connection to the new Music City Convention Center (MCCC) near 6<sup>th</sup> Avenue South and Demonbreun. TEG was authorized to begin the design of this project during the Third Quarter FY10. The completion of the design is anticipated in the Fourth Quarter FY10 with the bid and bid award also scheduled to occur during the Fourth Quarter. The construction of the new service lines and vaults is anticipated to begin in the First Quarter FY11.

14. DES078 - J. K. Polk Dripleg Installation

There is a dripleg in the JK Polk Building which does not comply with good engineering standards. Therefore, design drawings were developed and a contractor was selected to replace the existing dripleg with an appropriate dripleg. The work for this replacement is scheduled to take place during the Fourth Quarter FY10.

15. DES079 - TN Towers Gold Parking Lot Pavement Repair

Depressions have developed in the Gold Parking lot of the Tennessee Towers in areas which were disturbed during the implementation of DES029. A site review was held

and a contractor was selected to repair the pavement. This work will take place during the Fourth Quarter FY10.

B. Third Quarter FY10 Closed Projects

There were no projects closed during the Third Quarter FY10.

C. Capital Projects Budget

The following table summarizes the costs and remaining balance of the DES capital projects based on reported expenditures at the end of the Third Quarter FY10. Open projects or completed projects that require some additional management are shown. Projects that were closed to date are shown with a gray highlight. Since the remaining funds from the 2002A bond have been consumed, the previous projects associated with this bond are no longer noted in the following table. The 2008 Bond fund is also depleted and will be removed from the following table in future reports.



**Table 5. Third Quarter FY10 Capital Projects Budget Summary**

DES Project #	Description	Total Budget	Total Spent to Date	Remaining Balance
<b>2005B Bond Projects</b>				
DES064	Spring 09 Steam Shutdown	\$ -	\$ 911.54	\$ (911.54)
DES063	Sump Pump MH B and M	\$ -	\$ 4,389.50	\$ (4,389.50)
DES074	NES CIAC Payment	\$ -	\$ 100,633.41	\$ (100,633.41)
DES056	Citizen's Plaza Steam and Condensate	\$ -	\$ 241.68	\$ (241.68)
DES057	Manhole 13	\$ -	\$ 169.68	\$ (169.68)
DES061	Tunnel Steel Corrosion	\$ -	\$ 4,833.38	\$ (4,833.38)
DES073	MH 18 Condensate and Platform Exp	\$ -	\$ 12,046.21	\$ (12,046.21)
Total Closed Projects		\$ 7,320,301.40	\$ 7,606,382.98	\$ (286,081.58)
Project Development		\$ 866,198.60	\$ 315,570.26	\$ 533,685.07
<b>Total 2005B Bond</b>		<b>\$ 8,186,500.00</b>	<b>\$ 8,062,121.91</b>	<b>\$ 124,378.09</b>
<b>2007 Bond Projects</b>				
Total Closed Projects		\$ 2,374,348.00	\$ 2,620,770.53	\$ (246,422.53)
Project Development		\$ 484,152.00	\$ -	\$ 484,152.00
<b>Total 2007 Bond</b>		<b>\$ 2,858,500.00</b>	<b>\$ 2,620,770.53</b>	<b>\$ 237,729.47</b>
<b>2008 Bond Projects</b>				
DES046	Ryman Auditorium Cond Line	\$ 150,000.00	\$ 242,242.11	\$ (92,242.11)
DES048	Tunnel Lighting & Elec Ph III	\$ 100,000.00	\$ -	\$ 100,000.00
DES051	Exp Jt Replacement 4th Ave At MH 17	\$ 220,000.00	\$ 5,596.04	\$ 214,403.96
DES056	Citizen's Plaza Steam and Condensate	\$ -	\$ 126,659.01	\$ (126,659.01)
DES057	Manhole 13	\$ -	\$ 35,023.92	\$ (35,023.92)
DES061	Tunnel Steel Corrosion	\$ 250,000.00	\$ 3,631.90	\$ 246,368.10
DES063	Sump Pump MH B and M	\$ 35,000.00	\$ 18,195.46	\$ 16,804.54
Total Closed Projects		\$ 1,798,500.00	\$ 2,447,151.56	\$ (648,651.56)
Metro Project Admin		\$ -	\$ -	\$ -
Project Man, Development, etc		\$ 187,393.20	\$ -	\$ 187,393.20
<b>Total 2008 Bond</b>		<b>\$ 2,878,500.00</b>	<b>\$ 2,878,500.00</b>	<b>\$ 0.00</b>
<b>2010 Bond Projects</b>				
DES059	CJC Steam & Cond Ser. Line Replace.	\$ 150,000.00	\$ 2,939.05	\$ 147,060.95
DES062	Stm and Cnd Line MHK to Wildhorse	\$ 300,000.00	\$ 24,803.36	\$ 275,196.64
DES066	First Ave MH Abandonment	\$ -	\$ 1,228.20	\$ (1,228.20)
DES067	Tunnel Rock Repair	\$ 1,152,000.00	\$ 16,920.05	\$ 1,135,079.95
DES068	St. Mary's Cond Tempering Station	\$ 20,000.00	\$ 8,536.21	\$ 11,463.79
DES069	Municipal Aud Tempering Station	\$ 25,000.00	\$ 3,581.99	\$ 21,418.01
DES070	MH 6 to 23 Cond Line	\$ 300,000.00	\$ 505.20	\$ 299,494.80
DES071	Hermitage Hotel Ser Modifications	\$ 125,000.00	\$ 1,073.55	\$ 123,926.45
DES072	Sheraton Stm & Cond Line	\$ 250,000.00	\$ 30.10	\$ 249,969.90
Total Closed Projects		\$ -	\$ -	\$ -
Metro Project Admin		\$ -	\$ -	\$ -
Project Man, Development, etc		\$ 88,000.00	\$ -	\$ 88,000.00
<b>Total 2010 Bond</b>		<b>\$ 2,410,000.00</b>	<b>\$ 99,993.56</b>	<b>\$ 2,310,006.44</b>

## V. Energy Distribution System Repairs, Improvements, PM and Emergencies

Several EDS repairs and improvements were made during the Third Quarter. The principle items for discussion are presented in the following sections.

## A. Repairs and Improvements

Several repairs were made to the EDS and at customer buildings during the quarter. The items listed herein fall outside the scope of the DES Capital Projects. The remaining value of the R&I budget at the end of the Third Quarter FY10 is \$503,796. Table 6 provides a summary of the FY10 expenditures and revenues to date associated with the R&I budget.

**Table 6. Repair and Improvement Expenditure and Revenue Summary**

Description	Date	Tracking #	Vendor	Expenditure	Transfers	Net Market Adjustment	Market Value	Balance
"Market Value" and "Cost Value" at end of FY09						\$ (580.00)	\$ 458,943.32	\$ 458,935.96
DES Repair And Improvements, for billing period of 6/28/09 - 8/1/09	08/11/09	DES-1043	TEG	\$ 455.30				
Constellation Energy - Period 6/1/09 - 6/30/09 (EDS Repair)	09/04/09	DES-1044	CEPS	\$ 837.67				
DES Repair And Improvements, for billing period of 8/2/09 - 8/29/09	09/16/09	DES-1056	TEG	\$ 56.85				
Constellation Energy - Period 7/1/09 - 7/31/09 (EDS Repair)	09/09/09	DES-1057	CEPS	\$ 619.73				
Constellation Energy - DES-066 Progress Billing	09/29/09	DES-1069	CEPS	\$ 24,724.22				
DES Repair And Improvements, for billing period of 8/30/09 - 10/3/09	09/28/09	DES-1068	TEG	\$ 5,661.15				
Constellation Energy - Period 7/1/09 - 7/31/09 (EDS Repair)	09/28/09	DES-1082	CEPS	\$ 3,293.57				
<b>Sub-Total First Quarter FY10</b>				<b>\$ 35,648.49</b>	<b>\$ 61,775.01</b>	<b>\$ (7.36)</b>	<b>\$ 26,119.16</b>	<b>\$ 26,126.52</b>
Constellation Energy - Period 9/1/09 - 9/30/09 (EDS Repair)	11/20/09	DES-1085	CEPS	\$ 6,149.92				
DES Repair And Improvements, for billing period of 10/4/09 - 10/31/09	11/05/09	DES-1081	TEG	\$ 2,756.46				
DES Repair And Improvements, for billing period of 11/1/09 - 11/28/09	12/04/09	DES-1096	TEG	\$ 36.30				
Constellation Energy - Period 10/1/09 - 10/31/09 (EDS Repair)	12/03/09	DES-1098	CEPS	\$ 3,051.32				
DES Repair And Improvements, for billing period of 10/4/09 - 10/31/09	01/08/10	DES-1112	TEG	\$ (1,019.45)				
Constellation Energy - Period 11/1/09 - 11/30/09 (EDS Repair)	01/06/10	DES-1114	CEPS	\$ 3,673.14				
Constellation Energy - DES-066 Progress Billing	01/06/10	DES-1113	CEPS	\$ 12,537.86				
DES Repair And Improvements, for billing period of 11/29/09 - 1/2/10	01/12/10	DES-1111	TEG	\$ 884.10				
<b>Sub-Total Second Quarter FY10</b>				<b>\$ 28,069.65</b>	<b>\$ 61,775.01</b>	<b>\$ -</b>	<b>\$ 33,705.36</b>	<b>\$ 33,705.36</b>
Constellation Energy - Period 11/1/09 - 11/30/09 (EDS Repair)	02/18/10	DES-1125	CEPS	\$ 1,088.54				
DES Repair And Improvements, for billing period of 1/3/10 - 1/30/10	02/09/10	DES-1124	TEG	\$ 7,097.38				
Constellation Energy - DES-060 Manhole 5 Structural Steel Insulation	1/6/2010	DES-1117	CEPS	\$ 5,497.80				
DES Repair And Improvements, for billing period of 2/1/10 - 2/27/10	3/10/2010	DES-1136	TEG	\$ 2,778.60				
Constellation Energy - Period 1/1/10 - 1/31/10 (EDS Repair)	3/3/2010	DES-1138	CEPS	\$ 8,271.03				
Constellation Energy - Automation of Neutralizing Amine Feed	3/2/2010	DES-1137	CEPS	\$ 3,289.00				
Constellation Energy - DES 060 MH 1.2.3 Insulation	3/30/2010	DES-1154	CEPS	\$ 28,458.00				
DES Repair And Improvements, for billing period of 2/28/10 - 4/3/10	4/12/2010	DES-1152	TEG	\$ 10,501.53				
DES Repair And Improvements, for billing period of 2/1/10 - 2/27/10	4/8/2010	DES-1153	TEG	\$ 6,682.80				
Constellation Energy - Period 2/1/10 - 2/28/10 (EDS Repair)	4/1/2010	DES-1156	CEPS	\$ 3,082.22				
<b>Sub-Total Third Quarter FY10</b>				<b>\$ 76,746.90</b>	<b>\$ 61,775.01</b>	<b>\$ -</b>	<b>\$ (14,971.89)</b>	<b>\$ (14,971.89)</b>
<b>Sub-Total Fourth Quarter FY10</b>				<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>
<b>FY 10 Year to Date</b>				<b>\$ 140,465.04</b>	<b>\$ 185,325.03</b>	<b>\$ (7.36)</b>	<b>\$ 503,795.95</b>	<b>\$ 503,795.95</b>

## B. Preventive Maintenance

Preventive maintenance, tunnel and manhole inspections and reviews of customers' mechanical rooms were performed during the quarter. The principle items for discussion are presented.

1. EDS Tunnel and Manhole Inspections
  - a. Rock continues to be in need of repair in the ceilings in the tunnels under Broadway, 4<sup>th</sup> Avenue and 7<sup>th</sup> Avenues. A Tunnel Rock Rehabilitation project is tentatively scheduled to begin during the Fourth Quarter FY10.
  - b. Some leaks were found and repaired during the quarter.
  - c. Minor repairs were made during the quarter.
2. State Tunnel Inspections
  - a. A leak was found and repaired during the quarter.
  - b. Other minor repairs were made during the quarter.
3. Manhole and Other EDS Inspections
  - a. The chilled water leak in MH M was monitored regularly until repairs were made during the shut-down. The vault was pumped as required.
  - b. Heat tracing was installed at the 401 Union building and at Parkway Towers.
  - c. Other minor items are included in the CEPS monthly reports.

## C. Emergencies

CEPS did not report any emergencies with the EDS during the quarter.

## D. EDS Walk-through

The EDS walkthrough was conducted on March 25 and 26, 2010. The tunnels were visited this quarter which includes the State Tunnel; Manholes D2 and D3; the AA Birch Tunnel; Manhole 23; the 7<sup>th</sup> Avenue Tunnel; the Broadway Tunnel; and the 4<sup>th</sup> Avenue Tunnel. The following comments and observations are a result of these visits:

1. State Tunnel
  - a. Several light bulbs were not working in the north tunnel. The State of Tennessee is in charge of maintaining the lighting. The State should be contacted and told that several bulbs require replacement.
  - b. There is an electrical junction box located at column W53 without a cover; this presents a safety hazard. The State is in charge of maintaining the electrical systems. The State should be contacted and told that a cover should be installed on this junction.

- c. There is a duplex condensate pump unit located at column N19. This unit pumps the condensate back to Manhole 18. One of these pump seals is leaking and should be replaced.
- d. There is some debris near column E1 consisting of old insulation, lagging, etc.; this debris should be removed from the tunnel.
- e. At column E13, there is a telecommunications pullbox with cable hanging down over the steam and condensate piping. It is assumed that the State is working on this telecommunications line however, there was no other equipment or tools at this location. The State should be contacted to ensure that they are aware of this condition and make sure that the box will be re-mounted on the wall.
- f. While conducting the walkthrough it was observed that none of the traps were functioning. Upon investigation it was discovered that an isolation valve ahead of the duplex condensate pumping unit was closed. It was not known why this valve was closed; no one with CEPS or the State remembered closing this valve. CEPS personnel drained the stagnant condensate from the piping and opened this valve and restored the system to service.

2. Manhole D2

- a. The western rail of the ladder which gives access to the elevated platform in this manhole does not extend above the elevated platform; this makes access to the platform a little difficult and its absence does not meet OSHA requirements. An extension to this western rail should be added to this ladder.
- b. For safety reasons and to comply with OSHA regulations, the ladder opening in the elevated platform should have a removable or hinged panel installed.
- c. There are sections of the elevated platform that do not have grating installed due to piping penetrations. This area presents a potential safety hazard and grating should be added or a railing with toeboard should be installed in order to comply with OSHA regulations.
- d. Water hammer could be detected from the nearby Manhole "D". Water hammer was noted in the Third Quarter 2008 and 2009 EDS Walkthrough Report and reportedly was investigated and found to be originating from a trap inside the Parkway Towers. The faulty trap was reportedly replaced. It is apparent that either the newly installed trap is not functioning properly or the cause of the water hammer has not been identified. This problem should be investigated further.
- e. There is some minor corrosion of some of the structural components in this manhole. This vault should be included in the 2010 capital project to repair and prevent structural corrosion.

- f. There are some leaves which have accumulated on top of the piping in this manhole. As these leaves can retain moisture which could lead to corrosion, these leaves should be removed from the manhole.
3. Manhole D2
- a. For safety reasons and to comply with OSHA regulations, the ladder opening in the elevated platform should have a removable panel installed.
  - b. There is one structural member in the elevated platform which has some corrosion; this vault should be included in the 2010 capital project to repair and prevent structural corrosion.
  - c. The ladder in this vault does not meet OSHA requirements; a cage should be added to meet these requirements.
4. AA Birch Tunnel
- a. There is some groundwater infiltration through the roof and sides of the tunnel in a couple of places. This infiltration should be monitored and noted changes in the tunnel walls reported.
5. Manhole 23
- a. There is a large amount of surface water which has accumulated at the entrance to this manhole. This accumulation is the result of a clogged drain in the entrance area. This drain should be cleared and a screen placed over the drain to prevent debris from becoming lodged in the drain.
  - b. There is a minor amount of debris and construction material in this vault that needs to be cleaned out or removed.
  - c. There is some minor insulation degradation/damage in this manhole. Most of the manholes requiring re-insulation have been addressed. Therefore, the insulation in this manhole should be addressed once the tunnel rock rehabilitation project has been completed.
  - d. The steel structural components in the vault have experienced some corrosion. This vault should be included in the capital project to repair and prevent structural corrosion. These repairs should be addressed once the tunnel rock rehabilitation project has been completed.
6. 7<sup>th</sup> Avenue Tunnel
- a. There is some missing or damaged insulation in the 7<sup>th</sup> Avenue Tunnel. Once the tunnel rock rehabilitation project is completed, the insulation will be repaired in this tunnel.

- b. There is some significant rock spalling at various locations within the tunnels. This spalling will be addressed/repared with the Tunnel Rock Rehabilitation Project which is tentatively scheduled to begin in the Forth Quarter FY10.
  - c. There is a steam leak near station 7-40, the service lines to the Library. This leak should be repaired at the earliest opportunity.
7. **Broadway Tunnel**
- a. There is some missing or damaged insulation in the Broadway Tunnel. Once the tunnel rock rehabilitation project is completed, the insulation will be repaired in this tunnel.
  - b. There is a steam leak on a drain at B-62 that should be repaired during the next system shutdown.
  - c. There is a chilled water drain line at B-62 that consists of the drain piping and a flanged gate valve. The gate valve is does not have a blind flange installed. A blind flange should be installed on this drain.
  - d. There is a steam piping guide that has been cut off and removed at Marker B-49. The alignment of this section of piping should be verified along with the alignment of the slip type expansion joint. There does not appear to be any mis-alignment of the joint at this time, however, because the next closest guide is some 40 feet away, this guide “hoop” should be re-installed once the piping alignment is verified. This comment has appeared in the last two EDS Walkthrough Reports for the tunnel systems dated July 1, 2008 and April 22, 2009.
8. **4<sup>th</sup> Avenue Tunnel**
- a. There is some missing or damaged insulation in the 4<sup>th</sup> Avenue Tunnel. Once the tunnel rock rehabilitation project is completed, the insulation will be repaired in this tunnel.
  - b. There is a chilled water service line at 4-62 (Suntrust service?); the service line has a tap on it which includes a valve and a flanged elbow. The elbow does not have a blind flange installed. A blind flange should be installed on this elbow.
  - c. There is a small steam leak on the expansion joint located at marker 4-62. This leak should be repaired at the earliest opportunity.
  - d. There is a small steam leak on the expansion joint located at marker 4-78. This leak should be repaired at the earliest opportunity.

## **VI. Customer Relations**

This section contains descriptions of the marketing efforts made by the DES Team during the quarter. The topics of interactions, meetings and training seminars with the customers are also discussed. There are currently 27 customers, comprised of 40 different buildings, connected to the EDS. Service to each of these buildings continues to prove satisfactory, and the responsiveness to customer issues is handled by CEPS in an excellent and professional manner.

### **A. Marketing**

TEG and Metro DES continue to monitor and remain involved with the progress associated with the development of the new Music City Convention Center (MCCC). Design began on the routing to the new MCCC during the quarter under capital project # DES-077.

### **B. Customer Interaction**

- Several customers reported issues with either their in-building heating or cooling systems. These issues were addressed by the CEPS customer service representative (CSR). In most cases, the issues related to failed customer equipment or the improper control of the building system.
- Chilled water return setpoints were raised above the contract values at the Renaissance Office Complex, the Renaissance Hotel and the Convention Center in January.
- The CEPS CSR contacted the Sun Trust Bank building personnel to request that their condensate be sent to drain to accommodate the repair to a leaking condensate line in the 4<sup>th</sup> Avenue Tunnel. The repairs were made in February, and the condensate was returned to service on February 19.
- A meeting was held with Municipal Auditorium personnel to discuss the installation of the new condensate tempering station in March.
- The facility administrator at the James Polk building was contacted to schedule a steam outage of the building to repair a drip leg. This work is scheduled for April 3.
- The setpoint on the chilled water pumps at the Tennessee Towers building was adjusted after it was found that they were not operating correctly.
- Discussions with the Metro Library regarding operating procedures has resulted in a significant reduction in their consumption of steam, improving their overall energy budget.
- Other minor issues and customer interactions are noted in the monthly CEPS reports.

## **VII. Recommendations**

Based on the review of the Third Quarter EGF and EDS operations, the following recommendations are made.

- The installation of a condensate polisher will permit the return of condensate from the distribution with high levels of iron or hardness. The current practice by CEPS is to dump the condensate to drain in the Broadway Avenue tunnel at MH-18 whenever the condensate impurities test high. Although this practice protects the boilers at the EGF, the operations incur increased costs in water, chemicals and fuel whenever the condensate is not returned. The cost of the polisher and its economic benefit to the customers will be investigated during the Fourth Quarter FY10. If the economic benefit is justified, the installation of the condensate polisher will be recommended.
- Safety items noted in the EDS Walk-through should to be addressed. A Repair & Improvement project number has been assigned to this matter and these items will be addressed.
- Cleaning, painting, replacement and repair of structural steel within manholes to reduce or eliminate corrosion has been assigned a capital project number of DES061. Repairs should begin in the Fourth Quarter FY10 and will be ongoing in a similar method to the Insulation Repair Project (DES060).
- Insulation which is not present or in disrepair within the manholes should be addressed through either additional capital projects, which include work within these manholes, or through DES060.
- CEPS should continue to remove any debris present in the manholes as inspections and schedules allow.