Metro Nashville
DISTRICT ENERGY SYSTEM

Operations Monitoring Report
First Quarter FY10

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October 28, 2009

I. Executive Summary

A review of the fiscal year 2010 (FY10) First Quarter performance and contract obligations between Nashville District Energy, LLC (CNDE) 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, CNDE has satisfactorily met all of the contract obligations to Metro and has had no contract violations.

For the First Quarter FY10, the chilled water sendout decreased by approximately 6% over the previous First Quarter (FY09), and the sales decreased by approximately 9%. The number of cooling degree days also decreased by approximately 18% over the same periods. The peak chilled water demand for the current quarter is 16,600 tons with a cooling load factor for the quarter of approximately 45%.

The steam sendout is approximately 5% lower this quarter than the previous First Quarter, and steam sales are down by approximately 5%. The quarter saw 11 heating degree days, whereas, the previous First Quarter did not experience any. Steam system losses were approximately 46% of the sendout which was approximately 28% higher than in the previous First Quarter. The peak steam demand for the current quarter is 40,688 pounds per hour, which represents a 8% increase from the previous First Quarter. The heating load factor for the quarter is approximately 52%, which is a decrease of approximately 12% from the previous First Quarter.

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 First Quarter. The total water consumption for the steam and chilled water plants has decreased approximately 21% from the previous First Quarter. However, the steam system experienced a 6% increase in water usage over the previous First Quarter, and the chilled water EDS make-up increased by approximately 56%.

Work continued on DES Capital and Repair & Improvement Projects during the First Quarter of FY10. Seven projects were closed during the First Quarter FY10: DES041/054, DES044, DES 0441, DES 046, DES 051, DES055, DES 055, DES 056 and DES057. One project, DES051, was substantially completed during the First Quarter with close-out expected during the Second Quarter. These capital projects are being funded by remaining resources from previous bonds. Design work began on three additional capital projects, DES062, DES063 and DES066 with anticipated construction beginning on these projects during the Second Quarter FY10. Repair and Improvements to the EDS continue as scheduled.

The system operating costs were $4,021,189 for the First Quarter FY10. This value represents approximately 19.2% of the total budget for FY10. The customer revenues from the sales of steam and chilled water was $3,543,542 which is approximately 19.1% of the budgeted amount. The difference between the operating costs and customer revenue, the Metro funding amount (MFA), is $477,706. This value is approximately 19.6% of budget.

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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 First 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, and the number of cooling degree days decreased by approximately 18% this quarter. The First Quarter FY10 was markedly colder and wetter than in previous years.

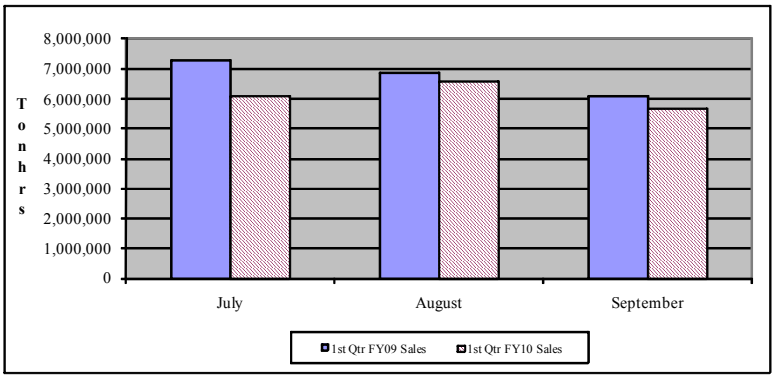

Figure 1. First Quarter FY10 Chilled Water Sales Comparison

The peak chilled water demand for the current quarter is 16,600 tons. The cooling load factor for the current quarter, relative to sendout, is approximately 58% and is 9% less than in the previous First 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.

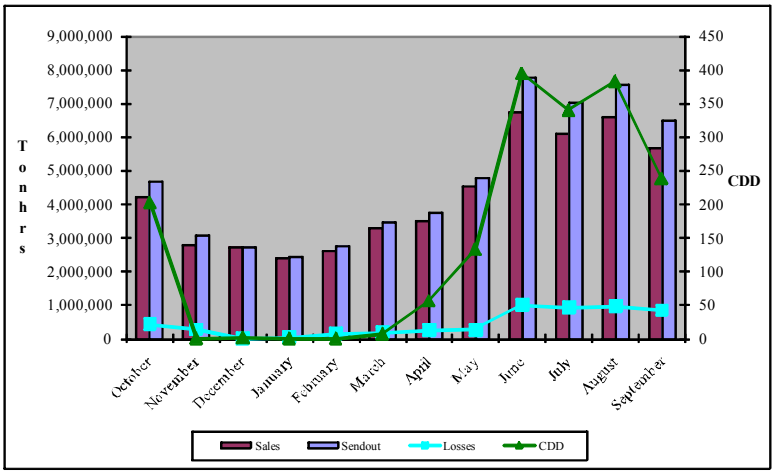

Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous 12 Months

2. Losses

A comparison of the total, chilled water energy losses in the EDS for the First 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.

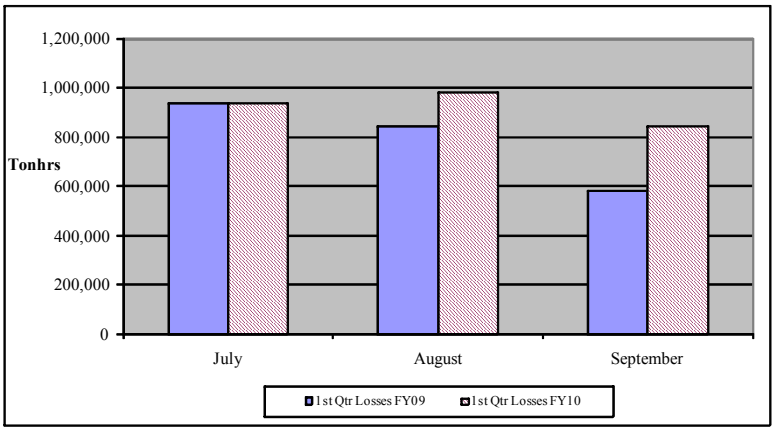

Figure 3. Chilled Water System Loss Comparison for the First Quarter FY10

A decrease in the mass loss had been noted in previous quarterly reports, however, the EDS make-up increased by approximately 56% over the previous First Quarter. The energy losses also increased by approximately 17%. The make-up to the cooling towers decreased by approximately 24%. The number of cycles of concentration in

the condensing water circuit increased in the First Quarter by approximately 6% over the previous First Quarter. The average number of cycles was 6.0 in the First Quarter FY10. The overall city water make-up comparison for the chilled water system is shown in Figure 4.

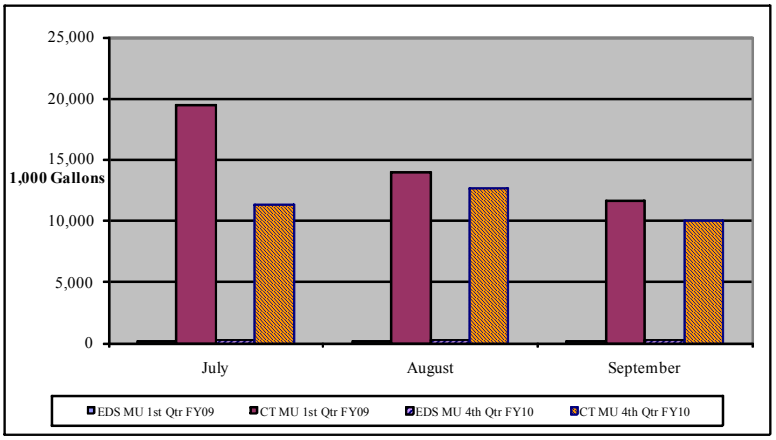

Figure 4. Chilled Water System City Water Usage Comparison

The increase in EDS energy loss could be attributed to a wetter than normal quarter. High levels of rainfall increase the moisture content of the soils surrounding the direct-buried piping which results in an increase in the heat transfer at the piping. The high levels of relative humidity experienced during the quarter may have contributed to the decrease in evaporation at the cooling towers, thus resulting in a decrease in the cooling tower make-up.

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 CNDE, the System Performance Guarantee levels as described in the ARMA are being achieved quite satisfactorily.

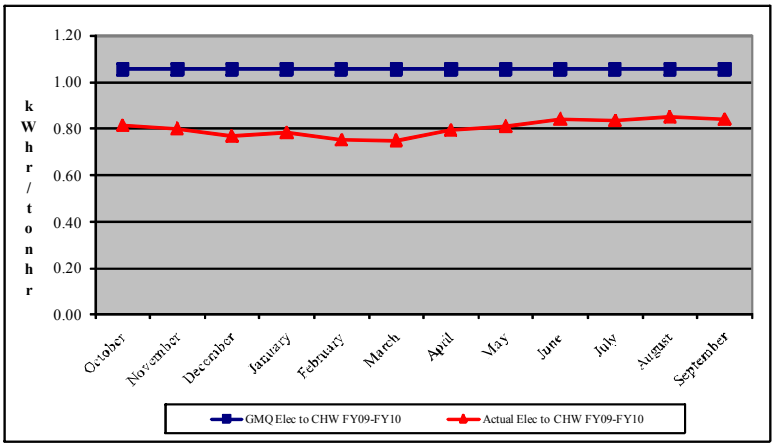

Figure 5. Chiller Plant Electrical Performance Guarantee Comparison for the Previous 12 Months

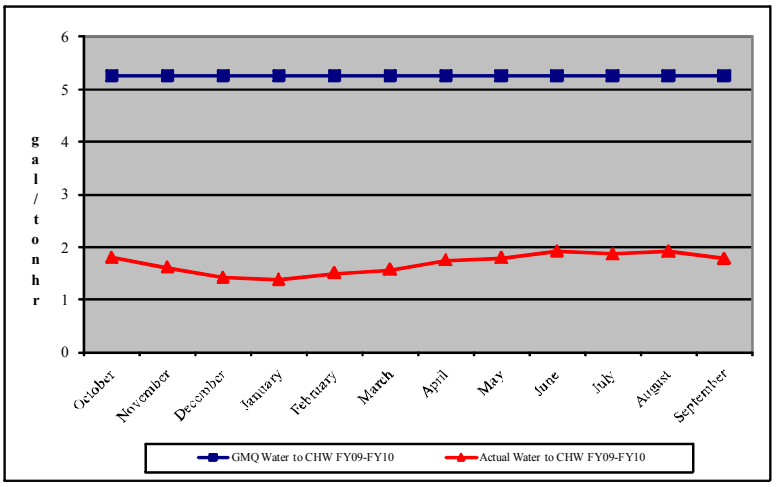

Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous 12 Months

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 10.6% over the First Quarter for FY09. The actual chilled water plant water conversion factor is approximately 1.5% less than in the previous First Quarter. The consumption of city water for the chiller plant for the current quarter is approximately 21% less than that for the previous First Quarter due largely in part to a significant decrease in cooling tower make-up (24%).

B. Steam

1. Sales and Sendout

The steam sendout decreased by approximately 5% over the previous First Quarter (FY09), but the sales decreased by approximately 20%. The steam system losses increased by approximately 28%. There were 11 heating degree days this quarter and none in the previous First Quarter. A comparison for the First Quarter steam sales is shown in Figure 7.

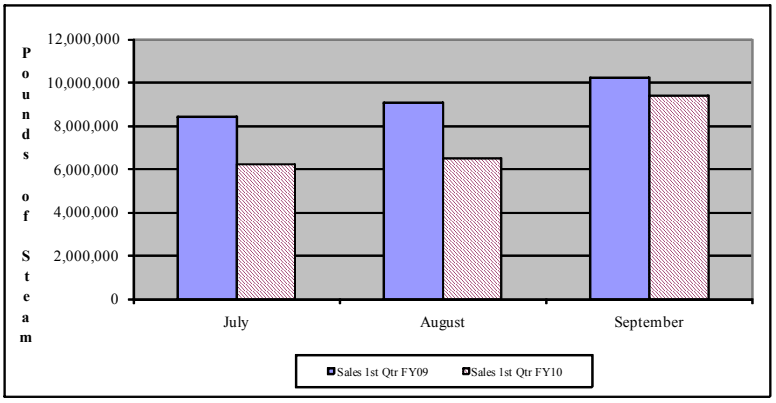

Figure 7. First Quarter FY10 Steam Sales

The increase in the steam losses could be attributed, in part, to a wetter-than-normal quarter, resulting in an increase in the amount of ground water present around the buried steam piping. The presence of this ground water has a tendency to increase the amount of heat transfer from the buried pipes.

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.

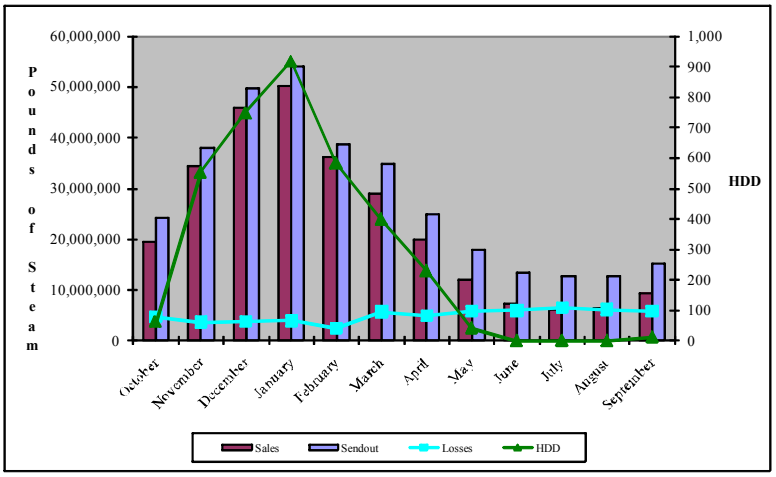

Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous 12 Months

The peak steam demand for the current quarter is 40,688 pounds per hour, which is approximately 8% higher than the peak demand for the previous First Quarter. The heating load factor for the current quarter, relative to sendout, is approximately 45% and represents a decrease in the load factor over the previous First Quarter of approximately 12%.

2. Losses

A comparison of the total steam mass losses in the EDS for the First 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 28% more than in FY09.

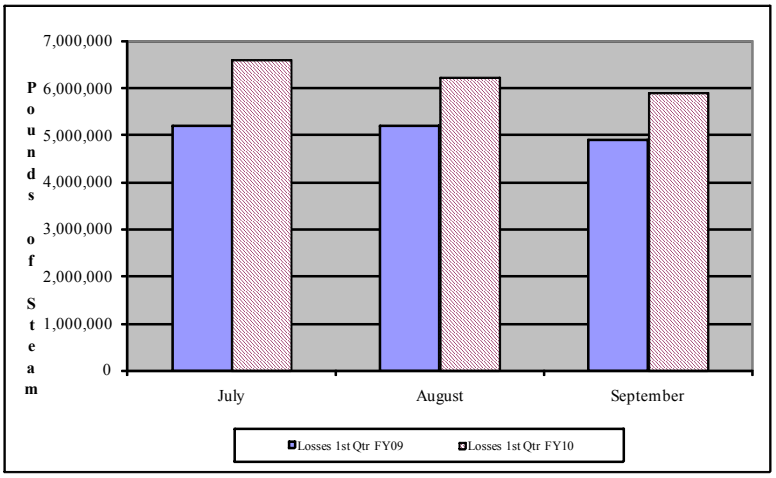

Figure 9. First Quarter FY10 Steam System Losses

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 First Quarter data in Figure 10. Figure 10 depicts an increase in city water make-up to the steam system of approximately 6% for the current quarter.

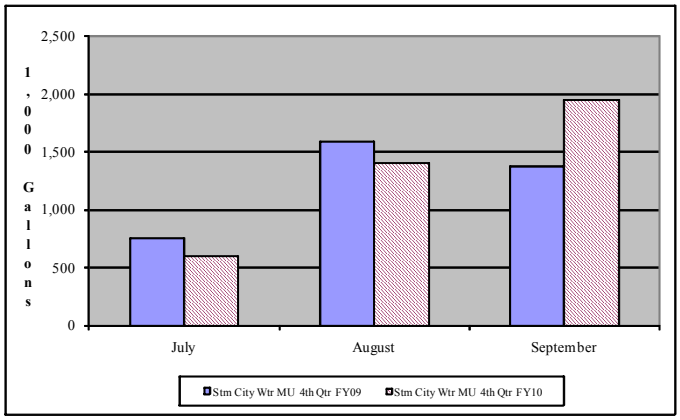

Figure 10. First Quarter FY10 Steam System City Water Make-up

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 CNDE, 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. The fuel consumptions remain below the GMQ for the quarter.

The electric usage for the current quarter is approximately 39% higher than in the previous First Quarter.

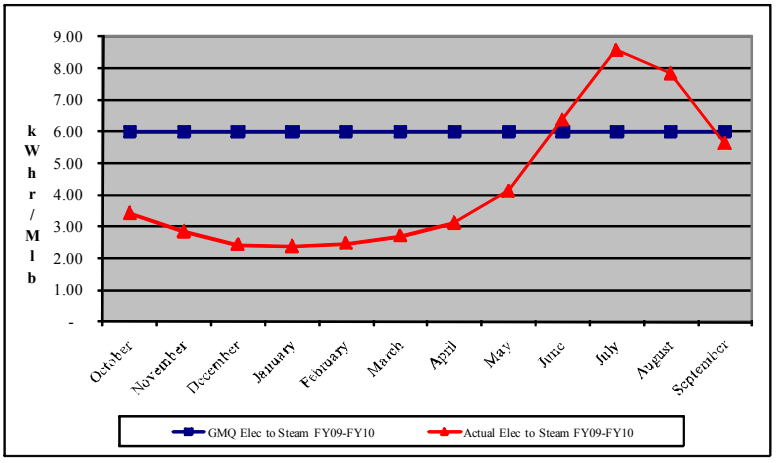

Figure 11. Steam Plant Electric Consumption Performance Guarantee Comparison for the Previous 12 Months

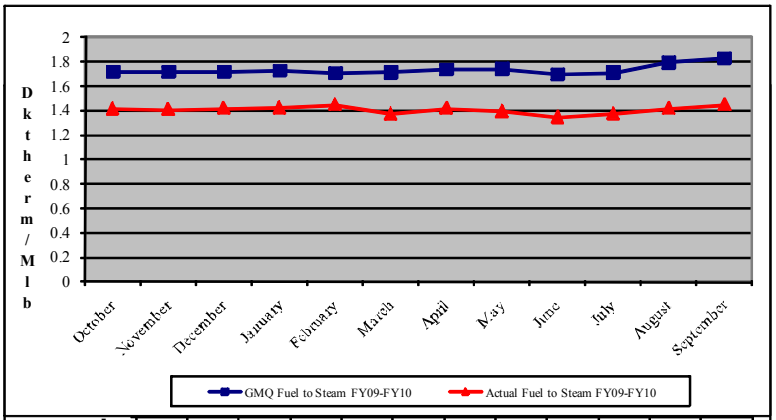

Figure 13. Steam Plant Fuel Consumption Performance Guarantee Comparison for the Previous 12 Months

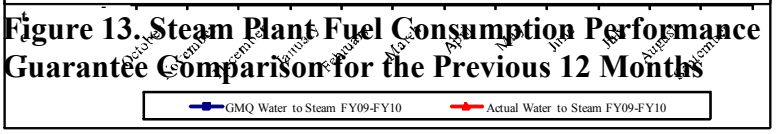

Figure 12. Steam Plant Water Consumption Performance Guarantee Comparison for the Previous 12 Months

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 First Quarter comparison of the Guaranteed Maximum Quantities (GMQ) of the criteria commodities (fuel, water and electricity).

Table 1. First Quarter FY10 Production, Sales and Consumption Summary

	Unit	First Quarter FY10	First Quarter FY09	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kWhrs	15,591,235	17,404,589	-10.42%
Chilled Water	kWhrs	15,433,967	17,262,842	-10.59%
Steam	kWhrs	157,268	141,747	10.95%
Total Water Use	kgal	38,792	49,277	-21.28%
Total Chilled Water	kgal	34,831	45,544	-23.52%
EDS Make-up	kgal	805	517	55.71%
Cooling Towers	kgal	34,026	45,025	-24.43%
Calc CT Evaporation	kgal	29,188	38,275	-23.74%
CT Blowdown	kgal	4,838	6,750	-28.33%
Calc # Cycles		6.03	5.67	6.40%
Steam	kgal	3,961	3,733	6.11%
Total Fuel Use	mmBTU	57,665	60,587	-4.82%
Natural Gas	mmBTU	57,665	60,579	-4.81%
Propane	mmBTU	0	8	N/A
Condensate Return	kgal	1,244	1,647	-24.43%
	lbs	10,147,509	13,428,608	-24.43%
Avg Temp	°F	169.7	158.0	7.38%
Sendout				
Chilled Water	tonhrs	21,103,800	22,566,100	-6.48%
Steam	lbs	40,821,000	43,003,000	-5.07%
Peak CHW Demand	tons	16,600	16,100	3.11%
Peak Steam Demand	lb/hr	40,688	37,719	7.87%
CHW LF		57.58%	63.48%	-9.30%
Steam LF		45.44%	51.63%	-12.00%
Sales				
Chilled Water	tonhrs	18,344,659	20,204,963	-9.21%
Steam	lbs	22,133,258	27,673,379	-20.02%
Losses				
Chilled Water	tonhrs	2,759,141	2,361,137	16.86%
Steam	lbs	18,687,742	15,329,621	21.91%
		45.78%	35.65%	28.42%
Degree Days				
CDD		961	1,170	-17.86%
HDD		11	0	N/A

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

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

GMQ Calculations	Unit	First Quarter FY10	First Quarter FY09	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00	
Electric Conversion	kWhr/Mlb	7.11	5.12	38.72%
GMQ Plant Efficiency	Dth/Mlb	1.777	1.774	
Plant Efficiency	Dth/Mlb	1.413	1.409	0.26%
Actual %CR		24.86%	31.23%	-20.39%
Avg CR Temp	°F	170	158	7.38%
GMQ Water Conversion	gal	4,325,057	4,170,080	
Water Conversion	gal	4,000,610	3,770,330	6.11%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055	
Electric Conversion	kWhr/tonhr	0.841	0.854	-1.53%
GMQ Water Conversion	gal/tonhr	5.25	5.25	
Water Conversion	gal/tonhr	1.90	2.25	-15.77%

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

D. Operating Costs

The operating costs for the DES are comprised of the fixed and variable costs. The fixed costs are those expenditures that do not vary depending on the amount of steam or chilled water produced or sold to the customers. These costs include the management fee to CNDE, debt service payments on the bonds and engineering and administration costs. The variable costs are dependent on the amounts of steam and chilled water produced and sold to the customers. These costs 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 First 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 system operating costs were $4,021,189 for the First Quarter FY10. This value represents approximately 19.2% of the total budgeted amount for FY10. The customer revenues from the sales of steam and chilled water was $3,543,542. This value includes $255,831 for the FY09 True-up and FY10 adjustments and penalties. The total customer

revenues represent approximately 19.1% of the budgeted amount. The difference between the operating costs and the customer revenues is the Metro Funding Amount (MFA) which totaled $477,7060 during the First Quarter. This value represents approximately 19.6% of the budgeted amount. At the time of this report, the CNDE invoice for their management fee of $392,376 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 First Quarter

Item	FY10 Budget	Total Expenses to Date	Percent of FY10 Budget
FOC: Basic	$ 3,976,200	$ 963,043	24.22%
FOC: 9th Chiller	$ 37,200	$ 9,024	24.26%
FOC: Change Order 6A	$ 73,400	$ 17,816	24.27%
FOC: Change Order 6B	$ 64,300	$ 15,597	24.26%
Chemicals	$ 161,200	$ 37,896	23.51%
Engineering	$ 26,200	$ 3,801	14.51%
Insurance	$ 43,700	$ -	0.00%
Marketing: CEPS Sales Activity	$ 9,800	$ -	0.00%
Metro Marketing	$ 35,000	$ 5,212	14.89%
Incentive Payments	$ -	$ -	n.a.
Project Administration	$ 24,000	$ -	0.00%
Metro Incremental Cost	$ 526,400	$ 94,387	17.93%
FEA: Steam	$ -	$ 14,041	n.a.
FEA: Chilled Water	$ -	$ 113,028	n.a.
ARFA	$ -	$ 13,987	n.a.
Metro Credit	$ -	$ (140,933)	n.a.
Water/Sewer	$ 689,600	$ 127,546	18.50%
Natural Gas/Propane	$ 4,692,900	$ 355,953	7.58%
Electricity	$ 5,034,100	$ 1,264,600	25.12%
EDS Repair & Improvement	$ 176,500	$ 35,648	20.20%
EDS Surcharge	$ 70,600	$ -	0.00%
Sub-total Operations	**$ 15,641,100**	**$ 2,930,645**	**18.74%**
2002 Bonds	$ 4,362,900	$ 1,090,698	25.00%
2005 Bonds	$ 627,600	$ -	0.00%
FY07 Projects	$ 227,800	$ -	0.00%
FY08 Projects	$ 220,500	$ -	0.00%
Debt Service Interest Revenue	$ (123,700)	$ (154)	0.12%
Oper. Reserve Funding Deposit	$ -	$ -	n.a.
Sub-total Debt Service	**$ 5,315,100**	**$ 1,090,544**	**20.52%**
Total Expenses	**$ 20,956,200**	**$ 4,021,189**	**19.19%**
Customer Revenues	**$ 18,512,100**	**$ 3,543,483**	**19.14%**
Total Metro Funding Amount	**$ 2,444,100**	**$ 477,706**	**19.55%**

The DES serves 27 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.

Table 4. FY10 Customer Revenues

Building	Chilled Water				Steam		
	Total Cost	Consumption (tonhrs/yr)	Unit Cost ($/tonhr)		Total Cost	Consumption (Mlb/yr)	Unit Cost ($/Mlb)
Private Customers	$ 1,030,068.66	6,773,773	$ 0.1521		$ 305,306.70	6,537	$ 46.702
State Government	$ 898,135.57	5,888,402	$ 0.1525		$ 381,463.04	6,838	$ 55.783
Metro Government	$ 804,636.00	5,682,484	$ 0.1416		$ 379,762.98	8,758	$ 43.364
New Customers	$ 358,673.78	2,482,116	$ 0.1445		$ 59,477.28	1,712	$ 34.742
Total	**$ 2,732,840.23**	**18,344,659**	**$ 0.1490**		**$ 1,066,532.72**	**22,133**	**$ 48.187**

Total Revenue	**$ 3,799,372.95**
True-up and Adjustments	**$ (255,831.38)**
Net Revenue	**$ 3,543,541.57**

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CNDE for FY10. Communication between TEG and CNDE continues to be excellent, and CNDE 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. CNDE reported several disruptions in service during the quarter, but the duration of each was short and had negligible apparent effects on the customers. The reliability issues are summarized in this section.

- There were no excursions or outages during August and September.
- On July 22nd, boiler 1 tripped due to a loose wire on the low water cut out switch. The trip caused the steam pressure to drop to 138 psi. Another boiler was immediately started, and the pressure returned to normal within a few minutes. The repair was made immediately.
- The motor for condenser water pump 1 failed on July 18. This failure caused the temperature on the chilled water supply to rise above 43.5˚F for 24 minutes. The motor was removed and sent out for repairs.

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 First 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, the American Red Cross and RMT.

D. Personnel

The EGF currently has twenty-six full time employees. These individuals are employed by CEPS. 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 city water make-up conductivity was consistently reported as being acceptable throughout the quarter. However, the chlorine levels were reported high on several occasions, but the sulfite injection system appears to be controlling chlorine levels prior to boilers.
  - The neutralizing amine auto-feed controller continues to be adjusted as the steam load changes.
  - Due to repeated and consistent high levels of pH, hardness and iron in the condensate return from the EDS, the condensate was sent to drain for most of August and September. The condensate return for the quarter was approximately 25% of the steam sendout.

- 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

CNDE 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.

- The nozzles for deaerator 1 were cleaned.
- The grease lines on cooling towers 5, 8 and 17 were repaired.
- The inlet valve on boiler 4 steam blanket line was replaced.
- The failed condenser water pump 1 motor was sent out for repairs. It was re-installed in August.
- A chemical pump was repaired along with a leak on a chemical line.
- The 2" back-flow preventer on the domestic water line was repaired.
- Two roof leaks were repaired.
- A new cooling fan was installed on boiler feedwater pump 5 motor.
- The replacement of the cooling tower fan breakers began in September. These items are being supplied by the manufacturer under warranty.
- Other minor repairs and maintenance were made during the quarter and are listed in the monthly reports issued by CNDE.

H. EGF Walk-through

A quarterly Walk-through of the EGF was performed on September 23, 2009, 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.

- The lights noted in the previous walkthrough as being non-operational have been repaired.
- The operator log book indicated minor problems with the controls server during September 2009.
- The log book also indicated repeated problems with the fire alarm panel during August and September. The issues appear to have been resolved with the installation of a new panel behind the front desk.

- The steam and mud drums for boiler 4 were open for inspection during the walkthrough. There did not appear to be any significant scale or corrosion or evidence of hot spots on the furnace walls.
- 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 boxes, florescent bulbs and paint are being stored in the electrical room. This item was noted in the previous quarter's walk-through.

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. Due to construction projects being undertaken by other Metro departments within the city, and their impact to DES planned projects, TEG has re-prioritized the remaining FY08 projects and planned FY09 projects. Costs for these projects will be paid from funds already appropriated. New projects are anticipated for the 2010 Bond Projects, but the majority of these projects remain in the planning stages of development.

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

A. First Quarter FY10 Open Projects

The following projects remained open at the end of the First 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 First 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 will be completed prior to the lighting and electrical upgrades.

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

Bids will be taken for three additional manholes to be re-insulated, Manhole 1, 2 and 3 early in the Second Quarter FY10. It is anticipated that this work will be awarded

and completed in the same quarter. The work associated with this project will be ongoing as required.

4. DES051 - Expansion Joint Replacement - 4th Ave Tunnel

A new expansion joint was ordered during the Second Quarter FY09 with it was delivered during the Third Quarter FY09. Due to other higher priority projects, design drawings for the installation of this expansion joint were delayed until the Fourth Quarter FY09. Bids were received during the initial weeks of the First Quarter FY10 and the work on this project was completed during the same quarter. Close-out documents being accumulated, and it is anticipated that this project will be closed during the Second Quarter FY10.

5. DES062 - Steam and Condensate Replacement to 120 2nd Avenue North

The condensate service line to 120 2nd Ave. North (Wildhorse Saloon) has been out of service for several months. Bids were received in early 2008 to replace the condensate service line along with the steam service line, but the pricing was extremely high thus the project did not move forward. Therefore, a condensate tempering station was installed at the Wildhorse Saloon under DES052 in order to meet Metro regulations for the disposal of this condensate to the sanitary sewer system.

There is a small manhole in 1st 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 thus avoid potential costly repairs. The design for the replacement of these service lines was completed during the First Quarter FY10 and it is anticipated that the project will be bid and awarded during the Second Quarter FY10. Due to the holidays, completion of the work in First Avenue and Riverfront Park is scheduled for mid-December.

6. 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. Currently this project is in the final phase of design, and it is anticipated that the project will be bid and awarded during the Second Quarter FY10.

7. 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. A safety hazard could become present 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. Therefore, these manholes will be inspected and filled with concrete. It is anticipated that the inspections, bidding and implementation of this project will take place during the Second Quarter FY10.

8. DES067 - EDS Tunnel Structural (Rock) Rehabilitation

A structural engineer has been released to begin the design for the repairs to the tunnel rock walls. It is anticipated that the design will be completed during the Second Quarter FY10, and the repair work could possibly be bid during the same quarter.

B. First Quarter FY10 Closed Projects

The following projects were closed during the First Quarter FY10:

DES041 - Symphony Condensate Repair (Updated to DES054)
DES044 - MH 5 to MH 9 Condensate Line Replacement
DES0441 - Modification of Manhole 9
DES046 - Ryman Auditorium Condensate Line
DES055 - Rebuild of Manhole "C"
DES056 - Steam Repair and Condensate Replacement MH-11 to Citizen's Plaza
DES057 - Steam & Condensate Valve Replacement: MH-13 - Phase I

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 First 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.

Table 5. First Quarter FY10 Capital Project Budget Summary

	DES Project #	Description	Total Budget	Total Spent to Date	Remaining Balance
2005B Bond Projects					
		Total Closed Projects	$ 7,320,301.40	$ 7,604,519.50	$ (284,218.10)
		Project Development	$ 866,198.60	$ 315,570.26	$ 546,923.19
		Total 2005B Bond	**$ 8,186,500.00**	**$ 7,923,794.91**	**$ 262,705.09**
2007 Bond Projects					
		Total Closed Projects	$ 2,374,348.00	$ 2,620,770.53	$ (246,422.53)
		Project Development	$ 484,152.00	$ -	$ 484,152.00
		Total 2007 Bond	**$ 2,858,500.00**	**$ 2,620,770.53**	**$ 237,729.47**
2008 Bond Projects					
	DES046	Ryman Auditorium Cond Line	$ 150,000.00	$ 31,405.31	$ 118,594.69
	DES048	Tunnel Lighting & Elec Ph III	$ 100,000.00	$ -	$ 100,000.00
	DES051	Exp Jt Replacement 4th Ave At MH 17	$ 220,000.00	$ 7,804.58	$ 212,195.42
	DES056	Citizen's Plaza Steam and Condensate	$ -	$ 71,398.83	$ (71,398.83)
	DES057	Manhole 13	$ -	$ 15,235.80	$ (15,235.80)
	DES061	Tunnel Steel Corrosion	$ 250,000.00	$ 3,631.90	$ 246,368.10
	DES063	Sump Pump MH B and M	$ 35,000.00	$ 7,951.54	$ 27,048.46
		Total Closed Projects	$ 1,798,500.00	$ 2,075,195.36	$ (276,695.36)
		Metro Project Admin	$ -	$ -	$ -
		Project Man, Development, etc	$ 187,393.20	$ -	$ 187,393.20
		Total 2008 Bond	**$ 2,878,500.00**	**$ 2,212,623.32**	**$ 665,876.68**
2010 Bond Projects					
	DES059	CJC Steam & Cond Ser. Line Replace.	$ 150,000.00	$ -	$ 150,000.00
	DES062	Stm and Cnd Line MHK to Wildhorse	$ 300,000.00	$ -	$ 300,000.00
	DES067	Tunnel Rock Repair	$ 1,152,000.00	$ -	$ 1,152,000.00
	DES068	St. Mary's Cond Tempering Station	$ 20,000.00	$ -	$ 20,000.00
	DES069	Municipal Aud Tempering Station	$ 25,000.00	$ -	$ 25,000.00
	DES070	MH 6 to 23 Cond Line	$ 300,000.00	$ -	$ 300,000.00
	DES071	Hermitage Hotel Ser Modifications	$ 125,000.00	$ -	$ 125,000.00
	DES072	Sheraton Stm & Cond Line	$ 250,000.00	$ -	$ 250,000.00
		Total Closed Projects	$ -	$ -	$ -
		Metro Project Admin	$ -	$ -	$ -
		Project Man, Development, etc	$ 88,000.00	$ -	$ 88,000.00
		Total 2010 Bond	**$ 2,410,000.00**	**$ -**	**$ 2,410,000.00**

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

Several EDS repairs and improvements were made during the First 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 First Quarter FY10 is $498,987. Table 6 provides a summary of the FY10 expenditures and revenues to date associated with the R&I budget.

Table 6. Repair and Improvement FY10 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				
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				
Sub-Total First Quarter FY10				$ 1,131.88	$ 41,183.34	$ (7.36)	$ 40,044.10	$ 40,051.46
Sub-Total Second Quarter FY10				$ -	$ -	$ -	$ -	$ -
Sub-Total Third Quarter FY10				$ -	$ -	$ -	$ -	$ -
Sub-Total Fourth Quarter FY10				$ -	$ -	$ -	$ -	$ -
FY 10 Year to Date				$ 1,131.88	$ 41,183.34	$ (7.36)	$ 498,987.42	$ 498,987.42

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.

- EDS Tunnel and Manhole Inspections:
  - Rock continues to be in need of repair in the ceilings in the tunnels under Broadway and 7th Avenues.
  - Several leaks were found and repaired during the quarter.
  - Minor repairs were made during the quarter.
- State Tunnel Inspections:
  - Several leaks were found and repaired during the quarter.
  - Other minor repairs were made during the quarter.
- The chilled water leak in MH M was monitored regularly during the quarter, and the vault was pumped as required.
- Two steam traps were replaced on the state steam loop in the basement of the Andrew Jackson Building.
- A 4" ANSI Class 150 gate valve was replaced on the steam service line to the Rachel Jackson Building.
- A new access ladder was installed in Manhole 6A.

- A new access ladder was installed in Manhole K.
- A steam leak on steam trap line in Manhole B2 was repaired and a gasket on the steam valve (8" NPS ANSI Class 300) was replaced.
- CNDE assisted the contractor removing debris left in Manhole 11 during the Deaderick Street Renovation Project.
- Other minor items are included in the CNDE monthly reports.

C. Emergencies

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

D. EDS Walk-through

The primary EDS walk-through was conducted on September 23 - 28, 2009 by Jon Belcher, P.E. of TEG. The manholes visited this quarter include 1, 2, 3, 4, 6, 10, 15, 16A, 22B, S5, S6 and the Viridian Manhole. The following comments and observations are a result of these visits:

1. Manhole 1
   a. There is a fair amount of debris on the manhole floor which needs to be cleaned.
   b. A large portion of the manhole piping insulation is absent and the manhole is very hot. Prices for the re-insulation of this manhole are being received and reviewed by CNDE personnel. The piping should be re-insulated in the next several weeks.
   c. Portions of the steel structural components in the vault are badly corroded and need to be replaced. The remaining steel structural components need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a "High" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
   d. There is some spalling of the concrete walls and ceiling; these areas need to be repaired.

2. Manhole 2
   a. There is virtually no insulation on either the steam piping or the condensate piping. Prices for the re-insulation of this manhole are being received and reviewed by CNDE personnel. The piping should be re-insulated in the next several weeks.
   b. There are areas of the walls and roof where concrete has fallen off due to spalling. These areas need to be repaired.
   c. The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion. Some components

appear to need replacement. This vault should be a "High" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.

d. There is some mud accumulation and minor debris that should be removed.

3. Manhole 3
   a. Much of the piping does not have insulation. Prices for the re-insulation of this manhole are being received and reviewed by CNDE personnel. The piping should be re-insulated in the next several weeks.
   b. The steel structural components in the vault need to be cleaned of all rust and evaluated to determine if replacement of steel components is required. Structural steel components that do not need to be replaced should be painted to prevent further corrosion. This vault should be a "High" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
   c. There is some mud accumulation and minor debris that should be removed.

4. Manhole 4
   a. The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion. Some components appear to need replacement. This vault should be a "High" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
   b. There is a vent pipe in this manhole which is connected to a flash tank in the basement of the 401 Union St. As the trap in the manhole cycles, condensate is being vented into this manhole. TEG is investigating the solution to this problem.
   c. There are some debris and construction material in this vault that needs to be removed.

5. Manhole 6
   a. The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a "Low" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
   b. There is a leak at a condensate piping flange connection that should be repaired.
   c. There is some spalling of the vault's concrete wall that needs to be repaired.

6. Manhole 10
   a. The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a "Low" to "Moderate" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
   b. The asphalt pavement above the manhole has buckled and formed "humps" along the axis of traffic. Portions of the buckled pavement are so high there is evidence that the underside of vehicles have scraped the top of these "humps." The manhole did not seem unusually hot, so it is not clear at this time what is causing the pavement to buckle. The cause for this buckling should be investigated.
   c. There is some spalling of the vault's concrete wall that needs to be repaired.

7. Manhole 15
   a. The 4th Avenue tunnel access is open without any grating covering it. At one time this opening had a hinged section of grating covering it; this hinged section of grating should be re-installed.
   b. The chilled water piping includes fill connections. These connections should have caps installed on the open ends of the fill valves.
   c. There is some minor debris in this vault that should be removed along with a used insulation blanket.

8. Manhole 16A
   a. There is some minor corrosion on some chilled water piping support "tabs". This corrosion should be removed from these support tabs, and the tabs insulated to prevent further corrosion.
   b. The grated platform does not extend around the chilled water piping penetrations and presents a potential safety hazard. Additional grating should be added or a railing with toeboard.

9. Manhole 22B
   a. There is no grating around the vertical piping "penetrations" within this manhole. This presents a safety hazard. Grating or handrails with toeboards should be added to this vault. Access to this manhole should be restricted until this grating or handrails are installed.

10. Viridian Manhole
    a. No comments.

11. Manhole S5
    a. A steam valve's stem packing was leaking. CNDE personnel attempted to tighten the packing to stop the leak, but this attempt was unsuccessful. This leak should be repaired.
    b. The upper portion of this vault is above ground and has several openings in the sidewalls presumably for ventilation of the vault. However, due to these openings, this vault has a large amount of tree leaves inside along with some trash/debris. The presence of the leaves promotes the retention of moisture in the vault which could be detrimental to the components within the vault and the structure itself. The presence of the leaves also makes it difficult to assess the condition of the vault and components in the vault. In addition, these openings present a potential hazard to CNDE personnel due to objects and debris which could be thrown into the vault. Small mesh screens should be securely fastened over these openings to prevent leaves and debris from either being blown or thrown into the vault. The leaves and debris vault should also be cleaned from the vault.

12. Manhole S6
    a. Insulation is non-existent. Because of the small amount of piping that could be insulated in this vault and the absence of any valves or equipment that would require maintenance, there is no need to insulate this piping.
    b. The steel structural components and piping in the vault have experienced some corrosion. These components need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a "Low" to "Moderate" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
    c. Because of the lack of serviceable equipment in this vault, it is not necessary to inspect this vault on a monthly basis.

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 CNDE 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 Convention Center and Hotel.

B. Customer Interaction

- Several customers reported issues with either their in-building heating or cooling systems. These issues were addressed by the CNDE customer service representative (CSR). In most cases, the issues related to failed customer equipment or the improper control of the building system.
- The Renaissance Office Tower contacted CNDE in July to report that the demand excursion in chilled water for the month was due to a mechanical failure on the control air compressor.
- The CNDE CSR contacted the DES customers via email in July to request that they check for chilled water leaks within their buildings due to abnormally high levels of EDS make-up. The make-up level returned to normal two days later. However, in August, the Renaissance Hotel's building engineer reported a small leak on a chilled water coil in one of their meeting rooms. The repair was made two days later.
- In July, the Renaissance Hotel's building engineer called the CNDE CSR to report cooling issues in his building. After reviewing the data, it was determined that one of the upper hotel return temperature set points should be set at 49˚F and the lower hotel at 52˚F. These changes were made July 29th. In August, the Renaissance Hotel building engineer called again to request that the chilled water return set point be lowered to the contractual level to assist in cooling the building. The changes were made the following day such that the upper hotel TCV was re-set to 54˚F, but the lower hotel was not changed (49.5˚F).
- In August, the CNDE CSR contacted the Renaissance Hotel and asked to test the condensate return. The test showed 17 ppm of hardness. The condensate was placed to drain in the building. The customer informed CNDE that they would make necessary repairs. The heat exchanger was repaired and condensate was returned to the system on August 24th.
- A meeting was held in August between TEG, CNDE and the Hermitage Hotel to discuss several cooling issues experienced during the warmer months. Several recommendations were presented by TEG to assist in remedying these cooling issues. The majority of the issues are believed to be related to a lack of hydronic balance between the building coils. The building engineer agreed to proceed with his investigation of the items discussed.
- Other minor issues and customer interactions are noted in the monthly CNDE reports.

VII. Recommendations

Based on the review of the First 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 CNDE 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 Second 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.
- 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 will begin this fiscal year 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 to be addressed through either additional capital projects, which include work within these manholes, or through DES060.
- Minor leaks on steam valves and flanged joints should to be addressed.
- CNDE should continue to remove any debris present in the manholes and tunnels as inspections and schedules allow.