



Operations Monitoring Report
Second Quarter FY09

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I. Executive Summary

A review of the fiscal year 2009 (FY09) Second 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. Thus far in FY09, CNDE has satisfactorily met all of the contract obligations to Metro.

For the Second Quarter FY09, the chilled water sendout decreased by approximately 23% over the previous Second Quarter (FY08), and the sales decreased by approximately 18%. However, the number of cooling degree days increased by approximately 65% over the same periods. The peak chilled water demand for the current quarter is 12,300 tons with a cooling load factor for the quarter of approximately 39%.

The steam sendout is approximately 7.7% higher this quarter than the previous Second Quarter, and steam sales are up by approximately 14%. There were approximately 21% more heating degree days in the current quarter. Steam system losses were approximately 11% of the sendout which was approximately 31% less than in the previous Second Quarter. The peak steam demand for the current quarter is 110,813 pounds per hour, which represents an 11% increase from the previous Second Quarter. The heating load factor for the quarter is approximately 46%, which is a decrease of approximately 3% from the previous Second 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 Second Quarter. The total water consumption for the steam and chilled water plants has decreased approximately 22% from the previous Second Quarter due to the extensive repairs to the condensate return system.

Work continued on DES Capital Projects during the Second Quarter of FY09. For this quarter, only one FY07 project remained open, DES036 - 4th Ave Vent Fan which is a Repair & Improvement Project. Construction was substantially completed in the Second Quarter FY09 on this project, however, a final walkthrough will not take place until the 3rd Quarter. One other FY07 project was closed during the Second Quarter, DES042 - Condensate Service to 410 Union Street. Two FY08 Capital Projects were completed during the Second Quarter and closed out, DES047 and DES049. Two additional FY08 capital projects (DES045 and DES052) were substantially complete during the Second Quarter FY09 with close out expected to occur in the Third Quarter FY09. Two FY09 projects were substantially completed during the Second Quarter FY09 (DES054 and DES055) with close out expected to occur in the Third Quarter FY09. The FY09 capital budget has not yet been approved, thus these capital projects are being funded by resources from the previous years' capital budget accounts. Repair and Improvements to the EDS continue as scheduled.

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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 Second 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. The decrease in sales occurred as the number of cooling degree days increased over the previous quarter. However, fluctuations in the weather and with the daily temperatures could have contributed to this decrease in sales.

The peak chilled water demand for the current quarter is 12,300 tons. The cooling load factor for the current quarter, relative to sendout, is approximately 39% and is 8.9% less than in the previous Second Quarter.

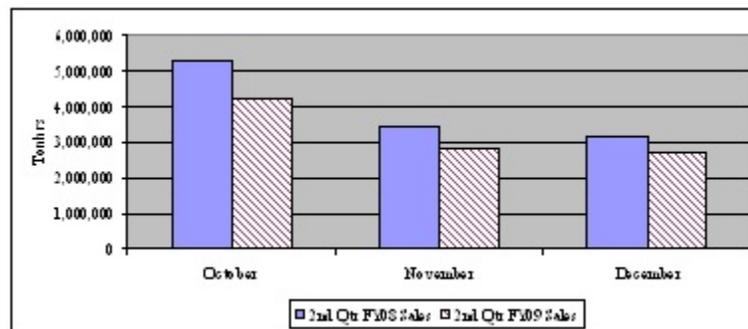


Figure 1. Second Quarter FY09 Chilled Water Sales

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.

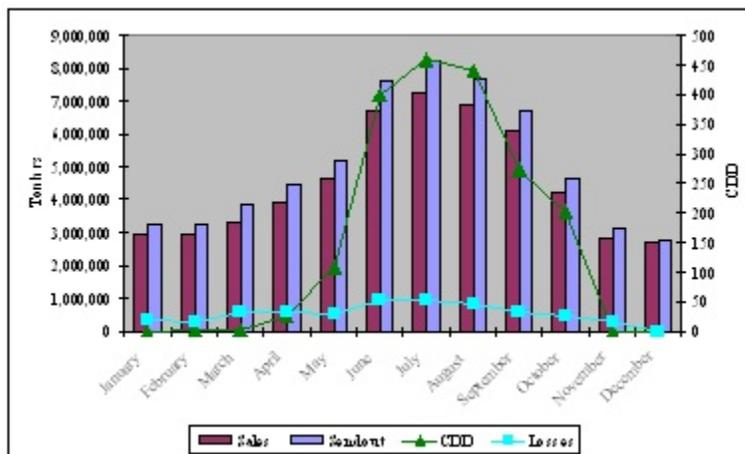


Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous 12 Months

2. Losses

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

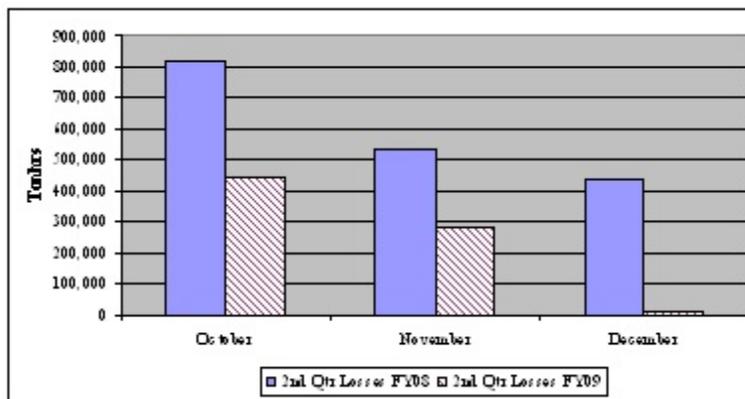


Figure 3. Chilled Water System Loss Comparison for the Second Quarter FY09

The mass loss to the EDS is reflected in the amount of city water make-up (MU) to the system. A increase in the mass loss is noted with a comparison between the Second Quarter EDS city water make-up for FY08 and FY09 of approximately 40%. However, the energy losses decreased by approximately 58%. The decrease in

energy loss and an increase in EDS make-up could be explained with a lower average ground temperature or higher average ground water content. Both of these phenomena would tend to decrease the amount of heat transfer between the pipe and the soil. The overall increase in make-up to the chilled water system is shown in Figure 4.

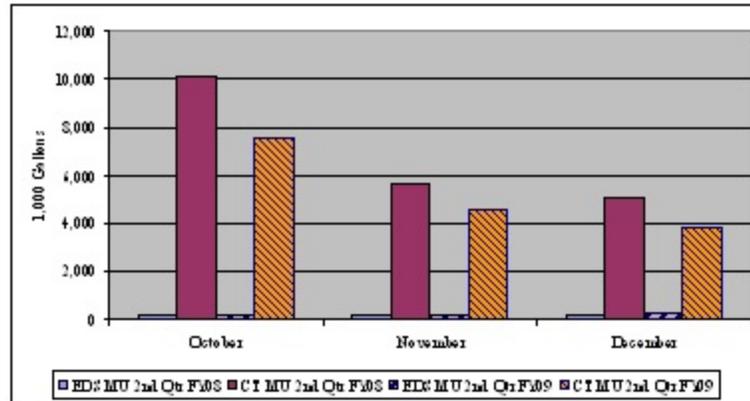


Figure 4. Chilled Water System City Water usage Comparison

In the operation of a cooling tower, the majority of make-up water required is due to the evaporation of the circulating cooling water. The balance of the make-up is due to the blow down of the tower required by the levels of concentration of particulates and other contaminants entrained in the circulating water. The ratio between the amount of make-up due to evaporation and due to blowdown is referred to as the cycles of concentration. The recorded data for this quarter suggests that the plant operated with an average of 5.0 cycles throughout the quarter. This average number is approximately 18% higher than in the previous Second Quarter, indicating an improvement in the water chemistry at the cooling tower.

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

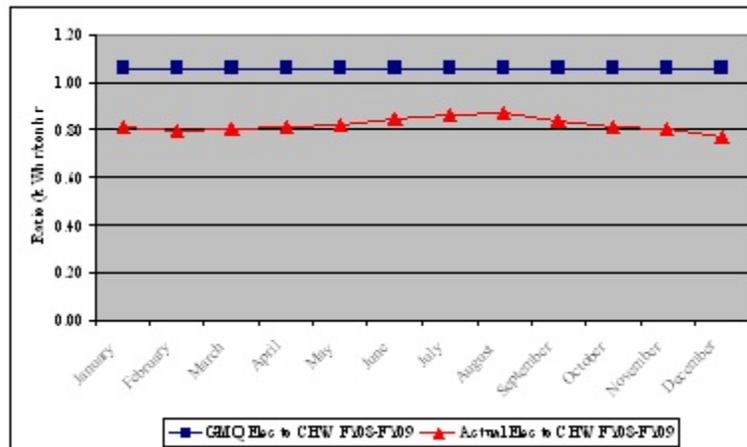


Figure 5. Chilled Water Plant Electric Performance Guarantee Comparison for the Previous 12 Months

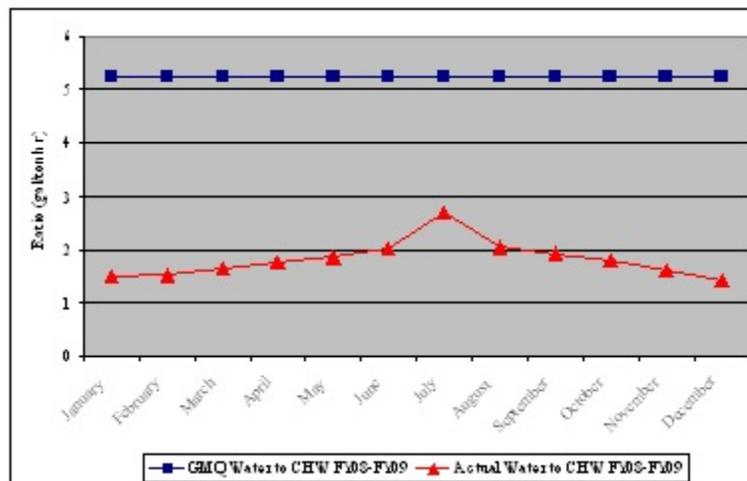


Figure 6. Chilled Water Plant Water Consumption Performance Guarantee Comparison for the Previous 12 Months

The chilled water allocation of the electric consumption falls under the GMQ limit of 1.055 kWh per tonhr for the current quarter, and no excursion is reported for the current fiscal year. The electric usage for the current quarter increased approximately 2.4% over the Second Quarter for FY08. The actual chilled water plant water conversion factor is approximately 5% less than in the previous Second Quarter. The consumption of city water for the chiller plant for the current quarter is approximately 22% less than that for the previous Second Quarter.

B. Steam

1. Sales and Sendout

The steam sendout increased by approximately 8% for the current quarter over the previous Second Quarter (FY08), and the sales increased by approximately 14%. The steam system losses decreased by approximately 26%. The number of heating degree days increased by approximately 21% with a 31% increase occurring in December alone. A comparison for the Second Quarter steam sales is shown in Figure 7.

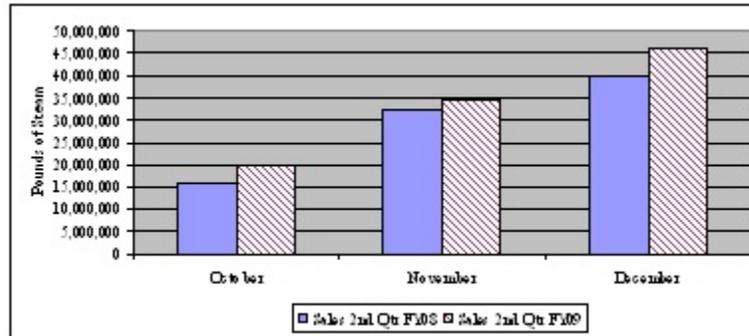


Figure 7. Second Quarter FY09 Steam Sales

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.

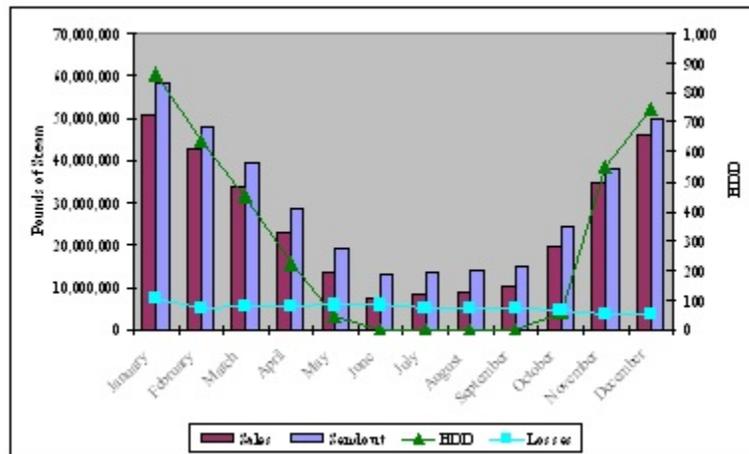


Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous 12 Months

The peak steam demand for the current quarter is 110,813 pounds per hour, which is approximately 11% higher than the peak demand for the previous Second Quarter. The heating load factor for the current quarter, relative to sendout, is approximately 46% and represents a slight decrease in the load factor over the previous Second Quarter.

2. Losses

A comparison of the total steam mass losses in the EDS for the Second 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 31% less than in FY08.

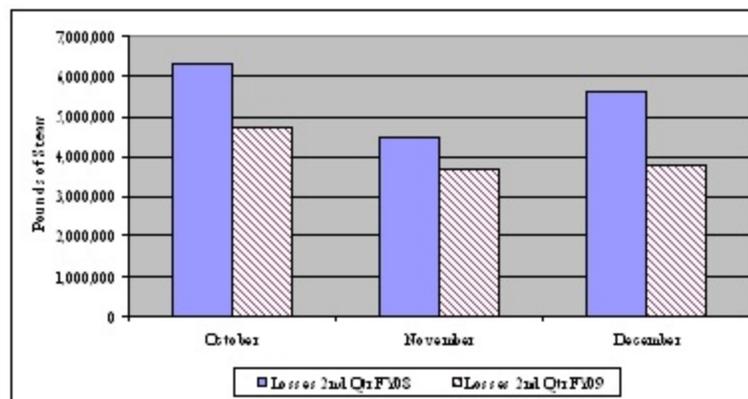


Figure 9. Second Quarter FY09 Steam System Losses

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 Second Quarter data in Figure 10. Figure 10 depicts a decrease in city water make-up to the steam system of approximately 21% for the current quarter.

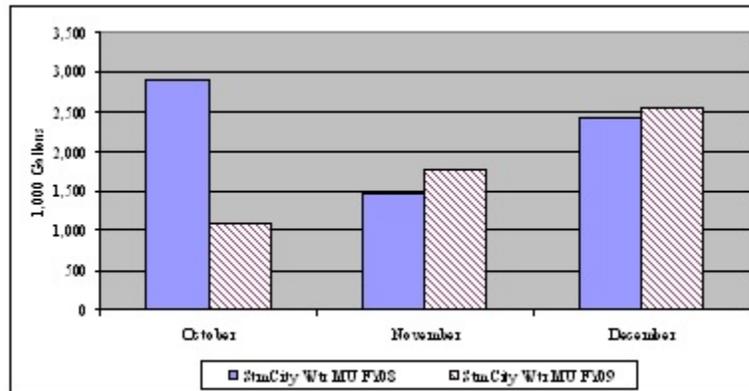


Figure 10. Second Quarter FY09 Steam System City Water Make-up

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 a single excursion in the electric consumption in June 2008. The fuel consumptions remain below the GMQ for the quarter. The electric usage for the current quarter is approximately 9% less than in the previous Second Quarter.

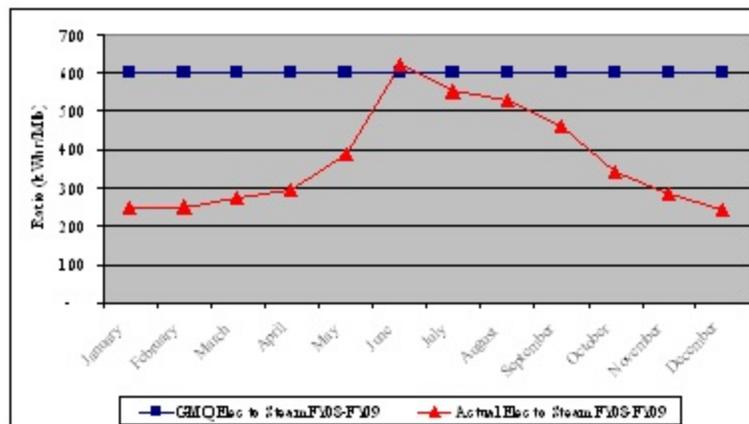


Figure 11. Steam Plant Electric Consumption Performance Guarantee Comparison for the Previous 12 Months

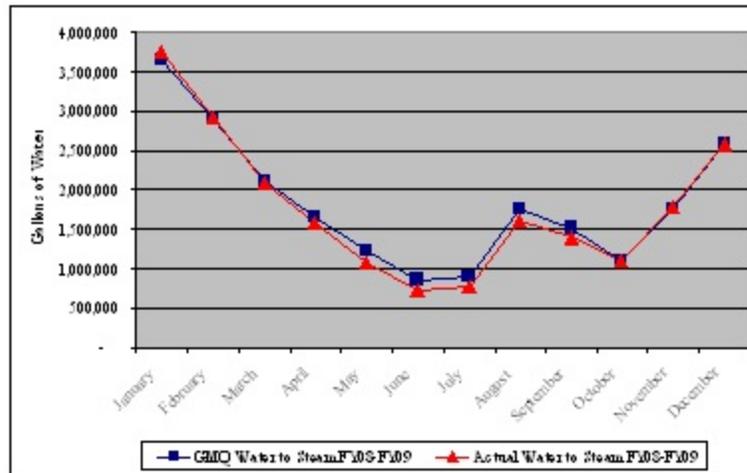


Figure 12. Steam plant Water Consumption Performance Guarantee Comparison for the Previous 12 Months

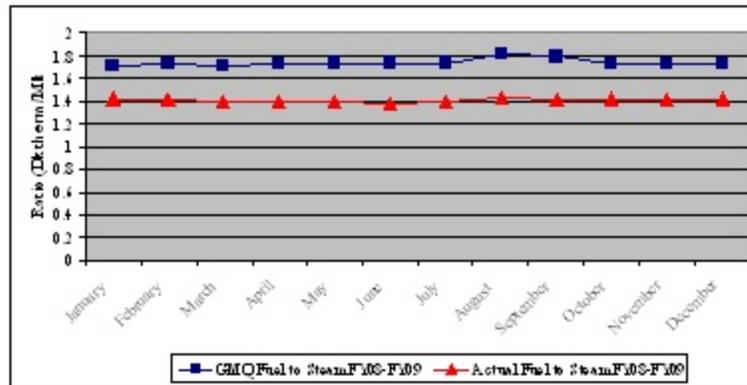


Figure 13. Steam plant Fuel Consumption Performance Guarantee Comparison for the Previous 12 Months

C. Contract Guarantee Performance

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

Table 1. Second Quarter FY09 Production, Sales and Consumption Summary

	Unit	Second Quarter FY09	Second Quarter FY08	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kWhrs	8,025,171	9,480,610	-15.35%
Chilled Water	kWhrs	7,748,815	9,215,043	-15.91%
Steam	kWhrs	276,356	265,567	4.06%
Total Water Use	kgal	21,995	28,077	-21.66%
Total Chilled Water	kgal	16,592	21,280	-22.03%
EDS Make-up	kgal	673	482	39.63%
Cooling Towers	kgal	15,919	20,798	-23.46%
Calc CT Evaporation	kgal	13,264	16,814	-21.11%
CT Blowdown	kgal	2,655	3,984	-33.36%
Calc #Cycles		5.00	4.22	18.37%
Steam	kgal	5,403	6,797	-20.51%
Total Fuel Use	mmBTU	158,483	146,111	8.47%
Natural Gas	mmBTU	158,451	146,050	8.49%
Propane	mmBTU	32	61	N/A
Condensate Return	kgal	9,031	7,049	28.11%
	lbs	73,653,850	57,491,402	28.11%
Avg Temp	°F	160.3	164.3	-2.43%
Sendout				
Chilled Water	tonhrs	10,477,100	13,645,600	-23.22%
Steam	lbs	112,207,000	104,217,000	7.67%
Peak CHW Demand	tons	12,300	14,600	-15.75%
Peak Steam Demand	lb/hr	110,813	100,156	10.64%
CHW LF		38.58%	42.33%	-8.86%
Steam LF		45.86%	47.13%	-2.69%
Sales				
Chilled Water	tonhrs	9,731,973	11,853,813	-17.90%
Steam	lbs	100,009,945	87,810,007	13.89%
Losses				
Chilled Water	tonhrs	745,127	1,791,787	-58.41%
Steam	lbs	12,197,055	16,406,993	-25.66%
		10.87%	15.74%	-30.95%
Degree Days				
CDD		203	123	65.04%
HDD		1,361	1,126	20.87%

*positive percent difference values imply an increase from FY08 to FY09

Table 2. Second Quarter FY09 Performance Guarantee Comparison for Steam and Chilled Water

GMQ Calculations	Unit	Second Quarter FY09	Second Quarter FY08	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00	
Electric Conversion	kWhr/Mlb	2.76	3.02	-8.63%
GMQ Plant Efficiency	Dth/Mlb	1.716	1.728	
Plant Efficiency	Dth/Mlb	1.412	1.402	0.74%
Actual %CR		65.64%	55.17%	18.99%
Avg CR Temp	*F	160	164	-2.43%
GMQ Water Conversion	gal	5,436,113	6,588,453	
Water Conversion	gal	5,457,030	6,864,970	-20.51%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055	
Electric Conversion	kWhr/tonhr	0.796	0.777	2.42%
GMQ Water Conversion	gal/tonhr	5.25	5.25	
Water Conversion	gal/tonhr	1.70	1.80	-5.03%

*positive percent difference values imply an increase from FY08 to FY09

III. EGF Operations

Items relating to the facility operations presented herein are derived from the reports issued by CNDE for the months of October, November and December 2008. Communication between TEG and CNDE continues to be excellent, and CNDE has reported and managed all EGF operations satisfactorily and according to agreement.

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 October or December.
- An isolation valve to the cooling tower make-up line was inadvertently closed on November 5th while performing maintenance. This valve closure caused the chilled water pumps to trip which subsequently shutdown the chillers. This shutdown caused an elevated chilled water sendout temperature for approximately 24 minutes until the cause of the problem was remedied.

- A coil at the Wachovia building burst causing flooding at the building and a substantial increase in the EDS make-up to the chilled water system. Between December 22 and 23, the make-up was approximately 65,000 gallons. This event had no effect on the chilled water temperature and did not cause any outage or excursion at the EGF or with the EDS.

B. Efficiency

The operation of the EGF satisfied the guaranteed levels for all commodity usage during the quarter. There were no excursions above the guaranteed levels for the Second 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 RMT, Inc.

An accident involving maintenance mechanic occurred during December. The person strained his thumb while exiting a manhole after performing an inspection. The employee was sent for treatment. This was an OSHA reportable event, but no lost time was involved in this incident.

D. Personnel

The EGF currently has twenty-six full time employees. 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.
 - Iron levels were high during the October sampling at the Andrew Jackson (State Tunnel), but were normal the other two months. The pH was noted as high at TN Tower during December.
 - The condensate return was 65% for the quarter, which represents a 28% increase over the previous Second Quarter.
- 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.

- Leaks were repaired on boilers #1, #2 and #4 steam blankets during the quarter.
- A new chemical pump, CL-4125, was installed during October.
- New blowdown lines for DA #1 and #2 tank water columns were installed in October.
- The drive belts for CT 13, 14, 15 and 18 were replaced during the quarter.
- The basin heaters for CT 15 and 16 were replaced in October.
- The jack shaft/linkage was repaired on boiler #1 in November.
- Trane replaced a failed thrust bearing on chiller #7B.
- 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 January 6, 2009, by Kevin Jacobs, P.E. and Harry Ragsdale. This review involved a tour of the facility with the primary points of interest and concern noted herein.

- The caution tape and safety padding on the cooling tower support beams at the south end of the cooling tower bay are missing or deteriorating. This item was noted in the previous quarter's walk-through and remains unaddressed.
- 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.
- The re-grading and sloping of the area at the west face of the EGF has not been completed. These repairs could help prevent further settling of the foundation and soil erosion. No action is required at this time.
- Empty boxes and paint are being stored in the electrical room. This item was noted in the previous quarter's walk-through. A pair of chairs and an ash tray was present in the electric room, as well. CNDE intends to address these issues this quarter.
- Excessive foam was present in CT 7, 8, 15, 16 and 18 during the walk-through. CNDE was notified and planned to take action. The presence of the foam could be related to an improper balance of chemicals in the condensing water.
- Excessive noise was observed in the piping around condensing water pump 4 during the walkthrough. The operator was notified, but he was aware of the noise and was preparing to start pump 3. The noise was believed to be caused by dissolved air within the condensing water.

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. As of the end of the Second Quarter, no funds have been appropriated for FY09. 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.

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

A. Second Quarter FY09 Open Projects

The following projects remained open at the end of the Second Quarter of FY09.

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 Second Quarter FY09. This project will remain open.

2. DES041 - Symphony Condensate Repair (Updated to DES054)

The Symphony's condensate is currently being tempered with city water and discharged to the sewer system via Manhole B4. Prior to this condensate being tempered, it was reported to have damaged some sewer piping near Manhole B4 at its discharge point. TEG completed an evaluation of the options available for disposal or recovery of the condensate. Based on the recovery of condensate from the Symphony and from the driplegs located in the three manholes along the route, combined with the potential damage which may occur to manhole structures due to the collection of condensate within vaults, a suitable payback existed to install a condensate return line from Manhole B4 to Manhole B. This new line will enable the recovery of the condensate from the Symphony and will also provide a means of recovery of condensate from the planned Convention Center.

The design of this condensate line was completed and issued for bid during the Fourth Quarter FY08. Bids were received early in the First Quarter FY09 and were reviewed and awarded. With this award, and due to the extensive research of potential solutions for the return or disposal of the Symphony's condensate, a new project number was assigned in order to separate this work from the prior investigations. This new project number is DES054.

Construction began in the First Quarter FY09 and was substantially completed during the Second Quarter FY09. Close-out of this project is expected to occur in the Third Quarter FY09.

3. DES044 - MH 5 to MH 9 Condensate Line Replacement

The condensate line between Manholes 5 and 9, located along 5th Avenue between Deaderick and Union Streets, has been isolated due to its poor condition. This segment of condensate line represents a portion of the "main condensate loop" within the downtown distribution system. The replacement of this section of the condensate return system will provide redundancy to enable the return of condensate to the plant from two directions, thus improving the reliability of the system.

As a result of additional research, the scope of this project needed to also include the repair of portions of the steam piping insulation along this route. During the Second Quarter, DES became aware of the Department of Public Works' Streetscape project for Deaderick Street. This Streetscape Project involves the refurbishment and revitalization of the Streetscape along Deaderick Street between 3rd Avenue North and 6th Avenue North. This Streetscape Project began construction during the Second Quarter FY 09. Because a significant portion of the condensate line between MH 5 and MH 9 falls within the boundaries of the Streetscape Project, DES had to

perform the design, bid and award this project during the Second Quarter. As planned, construction and completion of this DES project will take place during the Third Quarter FY09.

4. DES045 - MH 6 to MH 23 Condensate Line Replacement and the Sheraton Hotel Condensate Service Line Replacement

Thermographic imaging of the condensate line between Manholes 6 and 23, located along Union Street between 6th and 7th Avenues, indicated that the line had potential leaks. This section of the condensate main receives condensate only from the Hermitage Hotel. However, with the condensate line between MH 5 and 9 out of service, the condensate return from the 501 Building would also be lost if the section of line between MH 6 and MH 23 were to go out of service. Because the thermographic survey only indicated one or two potential problem spots, in an attempt to avoid the replacement of all 400 feet of piping, a design was completed to perform a repair to a portion of this line and to perform inspections to determine the extensiveness of deterioration.

This repair was bid and awarded during the Fourth Quarter FY08 and construction took place early in the First Quarter FY09. A severely damaged section of the condensate return piping was revealed along with deterioration of insulation on approximately 50 linear feet of the adjacent steam main. The damaged section of the condensate piping was removed and a camera was sent through the pipe to try and determine the condition of the remaining piping. The camera revealed that additional damage exists in the remainder of the condensate piping, and it is in need of replacement. Rather than immediately pursue the replacement of this condensate piping, it was decided that it would be more cost-effective to develop a design for a new condensate line that would be placed at a minimum depth below the road surface. Based on this decision, the severely damaged section of condensate piping was repaired and the deteriorated steam piping insulation was replaced. The excavation was backfilled and the roadway repaired. This project will be closed and a “shallow bury” replacement condensate main will be designed to be constructed at a future date.

Final close-out of this project has been delayed due to incomplete close-out documentation. It is expected that this project will be closed out during the Third Quarter FY09.

5. DES046 - Ryman Auditorium Condensate Line

The condensate service line from the Ryman Auditorium to the main return line in 4th Avenue is in very poor condition and has been isolated. Due to this isolation, the

condensate is currently being tempered with city water inside the Ryman Auditorium and then discharged to the Ryman's sewer system. As described in prior quarterly reports, it was believed that due to the length of this service line, the return on the capital cost replacement was inadequate. Therefore, the preferred solution was to install a tempering station at the customer's building to cool the condensate for disposal into the city sewer system. Based upon recently received bids on other DES projects, an adequate capital return might exist for the replacement of the condensate piping. Additionally, the Ryman representative's does not favor the tempering station and would prefer that the condensate be returned to the system.

A utility survey was performed in the First Quarter FY09, and TEG began a design for the replacement of the existing condensate piping. However, due to the re-prioritization of other DES projects resulting from the Deaderick Street Streetscape Project and the rebuild of Manhole C, the completion of the design of this work will be delayed until the Third Quarter FY09. Once the design is completed and bid, TEG will re-evaluate the most viable option.

6. DES048 - Tunnel Lighting & Electrical Upgrades Phase III

The lighting and some of the electrical system located in the Broadway, 4th Avenue and 7th Avenue distribution tunnels was in poor condition and presented a potential safety hazard to maintenance personnel. Therefore, a plan was developed to repair and replace the lighting and some electrical components in three phases over a three year period. The first two phases of this project have been completed, and the final phase is budgeted and scheduled to be replaced during this fiscal year. However, the sections of the tunnel system which this third phase addresses has experienced some structural degradation. Therefore, CNDE evaluated the structural aspects of these tunnel sections through a third-party consultant. This third party consultant's evaluation report was completed during the First Quarter FY09. This report was reviewed by both CNDE and TEG during the Second Quarter FY09. TEG plans to have the report reviewed by a structural engineer to determine the best course of action to proceed with the needed repairs. Once these needed repairs are made to the tunnel, this third phase of the lighting and electrical upgrades will proceed.

7. DES050 - Manhole & Tunnel Insulation Repair

Insulation in several of the manholes and some portions of the tunnels is in disrepair. Not only does this present a safety hazard to personnel, but it can also cause damage to manhole equipment, components and the manhole structure. The required work within these manholes has been prioritized, and a standard insulation specification has been completed. The receipt of bids for the repair and replacement of insulation

in the higher priority manholes began during the Third Quarter FY08 with the award of three manholes.

The insulation repair/replacement took place during the First Quarter FY09. Three additional high priority manholes were bid during the First Quarter of FY09. These bids were evaluated and an award was made and work began during the Second Quarter of FY09. The work related to these three manholes was substantially completed during the Second Quarter FY09, with final walk through and close-out documentation to take place and be presented during the Third Quarter FY09. The work associated with this project will be ongoing as required.

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

It has been determined that this project qualifies as a Repair & Improvement project and not a capital project. Therefore, it has been moved to the R&I category.

A new expansion was ordered during the Second Quarter FY09 with expected delivery during the Third Quarter FY09. Design drawings for the installation of this expansion joint will be completed during the Third Quarter FY09 with installation during the same quarter.

9. DES052 - Wildhorse Saloon Steam & Condensate Line Replacement

The condensate service line to the Wildhorse Saloon failed during FY07. In addition, CNDE has been monitoring a “hot spot” on the steam service line for several months. After a review of the condition and type of piping system serving this customer, it is anticipated that the steam line may also require replacement in the future. TEG completed the design for these modifications and bids were solicited for this project during the Second Quarter FY08.

Bids were received late in the Second Quarter FY08 for replacing only the condensate line, however, the pricing was prohibitive for the project to move forward. Therefore, as a temporary solution, a tempering station has been designed to cool the condensate and dispose of the effluent to the sewer system. The tempering system design was issued for bid early in the First Quarter FY09, and was substantially complete during the same quarter. Close-out documentation was received during the Second Quarter FY09. It is anticipated that final payment shall be made for this project during the Third Quarter FY09. At which time, the project will be closed.

10. DES053 - EDS Tunnel Structural Evaluation, Mapping & Rehabilitation

The tunnels underneath Broadway, 4th Avenue and 7th Avenue have experienced some structural degradation primarily due to the geology of the area and groundwater. Some prior structural degradation occurred in these tunnels and repairs were made. CNDE retained the same third party consultant that participated in the prior repairs to evaluate and “map” the tunnels to prioritize the structural degradation of these tunnels. This third party consultant’s evaluation report was completed early in the First Quarter FY09 was reviewed by both CNDE and TEG during the Second Quarter FY09. Even though there is not a concern regarding the collapse of any tunnel section, the report indicated that approximately 1,000 feet of the tunnels should have a high priority ranking to be repaired.

TEG plans to have the third-party report reviewed by a structural engineer. The structural engineer will then perform an on-site review of the tunnel condition in order to determine the best course of action to proceed with the needed repairs. Design drawings will be developed and the associated work will be bid. It is anticipated that the on-site review and development of bid documents will be prepared during the Third Quarter FY09, with bidding to take place during the same quarter.

11. DES055 - Rebuild of Manhole “C”

Manhole “C” is located on 5th Avenue North, between Charlotte Avenue and Gay Street. It is the last manhole within the district steam system which is constructed of steel. Because it is constructed of steel and it has been underground for 30+ years, it was in very poor condition and was listed on the FY09 capital projects. It is located in the driveway to the new MTA Bus Depot that was scheduled to open October 24, 2008. Because of Manhole C’s location, it was decided to expedite the design and construction schedule for the rebuild of this manhole to the Second Quarter FY09.

Design and bidding for the replacement of this manhole with a concrete structure was completed during the First Quarter FY09 with construction scheduled for September 2008. Construction began September 4, 2008, and was substantially complete on September 29, 2008. A final walkthrough and punchlist and subsequent closeout of this project has been delayed due to restricted access to the vault because of its location. It is expected that these activities will be completed during the Third Quarter FY09.

B. Second Quarter FY09 Closed Projects

There were five projects closed during the Second Quarter FY09: DES022, DES042, DES047 and DES049.

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 Second Quarter FY09. Open projects or completed projects that require some additional management are shown. Projects that were closed to date are shown with a gray highlight. The total, historic budget and expenditures of the 2002A Bond are not shown; the values shown only reflect the more recent projects and expenditures with the remaining project balance.

Table 3. FY09 Capital Projects and Bond Summary to Date

	DES Project #	Description	Total Budget	Total Spent to Date	Remaining Balance
2002A Bond Projects:					
	DES049	Temp Boiler Connection MH 15	\$ -	\$ 23,723.70	\$ (23,723.70)
	DES050	MH & Tunnel Inlet Repair	\$ -	\$ 23,417.88	\$ (23,417.88)
		Interest Earned	\$ -	\$ (5,474.20)	\$ 5,474.20
		To be Closed Project	\$ 3,727,702.59	\$ 3,484,037.21	\$ -
		Total 2002A Bond	\$ 3,727,702.59	\$ 3,727,702.59	\$ -
2005B Bond Projects:					
	DES020	Renovance Decoupling	\$ 538,818.00	\$ 593,478.75	\$ (54,660.75)
	DES004, 031, 022	Customer Metering	\$ 1,474,439.40	\$ 1,841,579.44	\$ (367,140.04)
	DES050	MH & Tunnel Inlet Repair	\$ -	\$ 3,003.00	\$ (3,003.00)
		To be Closed Project	\$ 5,105,044.00	\$ 4,885,174.90	\$ 219,869.10
		Project Development	\$ 844,196.40	\$ 315,570.24	\$ 528,626.16
		Total 2005B Bond	\$ 8,186,500.00	\$ 7,670,268.23	\$ 516,231.77
2007 Bond Project:					
		To be Closed Project	\$ 2,374,348.00	\$ 2,420,770.53	\$ (46,422.53)
		Project Development	\$ 484,152.00	\$ -	\$ 484,152.00
		Total 2007 Bond	\$ 2,858,500.00	\$ 2,620,770.53	\$ 237,729.47
2008 Bond Project:					
	DES044	MH 5 to MH 9 Cond Line	\$ 550,000.00	\$ 14,441.92	\$ 535,558.08
	DES044	Ryman Auditorium Cond Line	\$ 150,000.00	\$ 13,120.95	\$ 136,879.05
	DES048	Tunnel Lighting & Elec PH III	\$ 90,000.00	\$ -	\$ 90,000.00
	DES050	MH & Tunnel Inlet Repair	\$ 100,000.00	\$ 7,507.94	\$ 92,492.06
	DES051	Exp Jt Replacement + th Ave At MH 17	\$ 220,000.00	\$ 2,243.28	\$ 217,756.72
	DES052	Whittle's Stm & Cond	\$ 130,000.00	\$ 41,227.94	\$ 88,772.06
	DES053	Tunnel Mapping	\$ 37,404.80	\$ 1,435.35	\$ 35,969.45
	DES054	Synphony Condensate	\$ 925,034.00	\$ 12,154.17	\$ 912,879.83
	DES055	Mendle C Rebuild	\$ 225,000.00	\$ 24,145.37	\$ 200,854.63
	DES056	Citizen's Plaza Steam and Condensate	\$ -	\$ 4,814.91	\$ (4,814.91)
		To be Closed Project	\$ 1,118,500.00	\$ 33,409.71	\$ 1,085,090.29
		Metro Project Admin	\$ -	\$ -	\$ -
		Project Man Development etc	\$ 352,393.20	\$ -	\$ 352,393.20
		Total 2008 Bond	\$ 2,748,500.00	\$ 169,671.24	\$ 2,578,828.76

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

Several EDS repairs and improvements were made during the Second 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 Second Quarter FY09 is \$452,626. Table 4 provides a summary of the FY09 expenditures and revenues associated with the R&I budget.

Table 4. Repair and Improvement Expenditure and Revenue Summary to Date

Description	Date	Tracking #	Vendor	Expenditure	Transfer	Net Market Adjustment	Market Value	Balance
"Market Value" and "Cost Value" at end of FY08						\$ (526,25)	\$ 357,208.12	\$ 356,626.76
Manhole B2, B3, B4, and 4th Avenue Tunnel Vent for period 06/29/08 - 8/02/08	08/12/08	DES-879	TEG	\$ 1,843.05				
Manhole B2, B3, B4, Expansion Joint Replacement and 4th Avenue Tunnel Vent for period 08/5/08 - 5/5/08	09/08/08	DES-891	TEG	\$ 34.46				
Sub-Total First Quarter FY09				\$ 1,877.51	\$ 59,972.49	\$ (22.95)	\$ 58,072.65	\$ 58,094.98
4th Avenue Tunnel Vent for period of 9/10/08 - 2/2/09	10/14/08	DES-901	TEG	\$ 617.50				
Various repairs to manholes B5 and B4-8/1/08 - 3/5/09	10/14/08	DES-910	CEPS	\$ 1,202.04				
4th Avenue Tunnel Vent for period of 9/28/08 - 10/25/08	11/12/08	DES-912	TEG	\$ 108.00				
Chemical Treatment 10/1/08 - 10/31/08	11/25/08	DES-925	CEPS	\$ 3,756.99				
4th Avenue Tunnel Vent for period of 10/26/08 - 1/1/2009	12/10/08	DES-927	TEG	\$ 58.00				
Consultation Energy Source - US Engineering Invoice 7/27/2007 (R&I)	12/18/08	DES-934	CEPS	\$ 16,294.00				
Sub-Total Second Quarter FY09				\$ 22,062.53	\$ 59,972.49	\$ (22.54)	\$ 37,683.42	\$ 37,909.96
Sub-Total Third Quarter FY09				\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Fourth Quarter FY09				\$ -	\$ -	\$ -	\$ -	\$ -
FY09 YTD to Date				\$ 23,940.04	\$ 119,944.98	\$ (249.47)	\$ 452,963.59	\$ 452,625.70

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. The recommendations from the geotechnical consultant received during the Third and Fourth Quarters FY08 were reviewed, and the need to "map" the tunnel as the initial stage of the design to make repairs was approved. "Mapping" of the tunnel was conducted

during the First Quarter of FY09 and a report of the result of this mapping was presented. This mapping report was reviewed during the Second Quarter FY09. Please refer to DES053 in Section IV of this report for additional information.

- Several minor leaks were repaired during the quarter.
- State Tunnel Inspections:
 - State employees were notified of a broken belt on a ventilation fan in December.
- A broken discharge hose on the AA Birch tunnel sump pump was replaced in December.
- The sump pumps outside of Manhole D failed due to the deterioration of the impellers and the failure of a mechanical seal. They were replaced in December.
- In October, gaskets were replaced on two condensate valves and the belts were replaced on the 4th Ave Tunnel Exhaust fan.
- The determination of the energy consumptions based on monthly bills for a number of customers required reviews of their meter installations. All instruments were found to be operating correctly except that an RTD had failed at the Sommet Center. This faulty RTD was repaired, but some of the chilled water data for the Sommet had to be estimated for November.
- Additional thermographic inspections of the EDS revealed another new “hot spot” at St. Mary’s Church.
- A planned steam outage was necessary in October to repair a steam leak in Manhole 13. The outage only affected CJC, Metro Courthouse and AA Birch. These buildings were without steam for approximately 5 hours.
- 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

A quarterly “walk-through” of the energy distribution system was not performed this quarter due to scheduling conflicts and the attention necessary for the Deadrick Streetscape Projects. A review of the EDS will be made in the Third Quarter FY09 with the potential review of additional manholes and tunnels to compensate for the inability to review the EDS during the Second Quarter FY09.

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, CNDE and Metro DES continue to monitor and remain involved with the progress associated with the development of the New Convention Center.
- The MNDES Fall Newsletter was published December 11.
- The Five Year Anniversary Celebration is planned for January 16.
- The Semi-Annual Customer meeting was held October 16.

B. Customer Interaction

- The chilled water return temperature setpoint at the CJC was reset to their contractual value of 54°F on October 14.
- Several cooling problems were noted at the CJC which prompted a review of the building operations by the CSR. The problems were determined to be related to internal issues with the building and not with the service from DES.
- The chilled water return temperature setpoint at the War Memorial was reset to their contractual value on November 5.
- The Renaissance Hotel requested their chilled water return temperature setpoint be raised to 52°F (greater than the contract value) on November 19. On December 4, the Renaissance Hotel requested that their setpoint be raised again to 54°F.
- The Sommet Center had a problem with a condensate pump during December. CNDE provided assistance with this pump to ensure condensate return from this customer to the EDS.
- Other minor issues and customer interactions are noted in the monthly CNDE reports.

VII. Recommendations

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

- As mentioned in previous reports, further investigation is recommended regarding the addition of automated O₂-trim to the boilers. This increase in automation may increase the fuel efficiency of the boilers and may have a relatively short return on investment. TEG will begin the investigation of the economic benefit related to this modification during the fiscal year. Only the customers receive the economic benefit for this investment, thus funding for such projects should be the responsibility of the customers.

- Due to the apparent soil erosion on the west face of the EGF, CNDE should determine if the terrain on the west side of the EGF needs regrading to prevent rainwater from flowing into and under the foundation wall. These repairs could help prevent further settling of the foundation and soil erosion. No action is required at this time.
- 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 are anticipated to begin during FY09 and will be ongoing in a similar method to the Insulation Repair Project (DES050).
- Insulation which is either not present or in disrepair within the manholes needs to be addressed through either additional capital projects, which include work within these manholes, or through DES 50.
- Potential safety hazards within some of the manholes and tunnel shafts need to be addressed.
- CNDE should continue to remove any debris present in the manholes as inspections and schedules allow.