



**Operations Monitoring Report
Second Quarter FY08**

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I. Executive Summary

A review of the fiscal year 2008 (FY08) 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 and available funds for all active capital construction and repair and improvement projects are presented.

For the Second Quarter FY08, the chilled water sendout increased by approximately 5% over the previous Second Quarter (FY07), while the sales increased by approximately 3%. The number of cooling degree days increased by approximately 46% over the same periods. The peak chilled water demand for the current quarter is 14,600 tons with a cooling load factor for the quarter of approximately 42%.

The steam sendout is approximately 20% lower this quarter than the previous Second Quarter, and steam sales are down by approximately 25%. There were approximately 6% fewer heating degree days in the current quarter. Steam system losses were approximately 16% of the sendout compared to 12% from the previous Second Quarter. The peak steam demand for the current quarter is 100,156 pounds per hour, an approximate decrease of 22%. The heating load factor for the quarter is approximately 47%, which is a increase of approximately 2.5% from the previous Second Quarter.

The 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 improved approximately 3% from the previous Second Quarter. The total water consumption for the steam and chilled water plants has decreased approximately 36% from the previous Second Quarter due to the recent repairs to the chilled water and condensate return systems.

Work continued on DES Capital Projects during the Second Quarter of FY08. Modifications to both remaining metering projects (DES 021 & 022) was completed during the Second Quarter FY08. There is one FY07 project which remains open (DES 036: 4th Ave Vent Fan) and is expected to be complete by the end of the Third Quarter FY08. Several FY08 Capital project designs were completed and bid out during the Second Quarter with construction work planned to take place during the Third Quarter if approved to proceed. 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 slight increase in sales for the current quarter over the same quarter of the previous fiscal year. The increase in sales may be largely attributed to an increase in the number of cooling degree days for the quarter.

The peak chilled water demand for the current quarter is 14,600 tons occurring during the month of October. The cooling load factor for the current quarter, relative to sendout, is approximately 42% as compared to 39% for the previous Second Quarter.

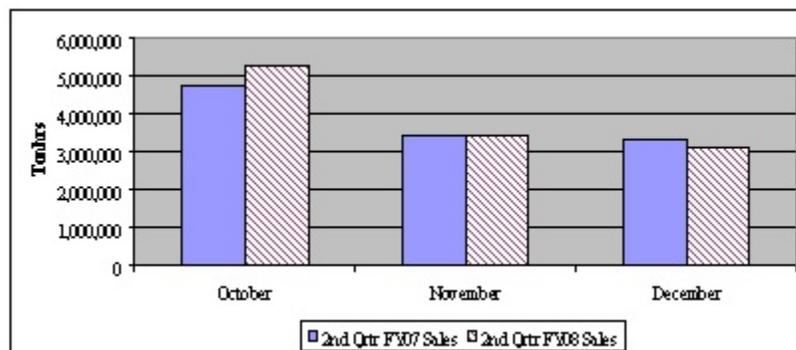


Figure 1. Second Quarter Sales Comparison

Figure 2 shows the chilled water sales, sendout and losses for the 2008 fiscal year to date. 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.

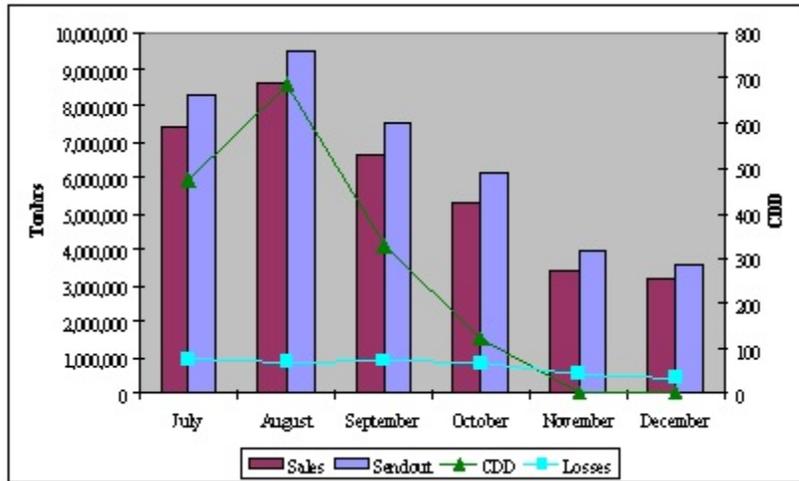


Figure 2. FY08 Chilled Water Sales, Sendout and Losses

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.

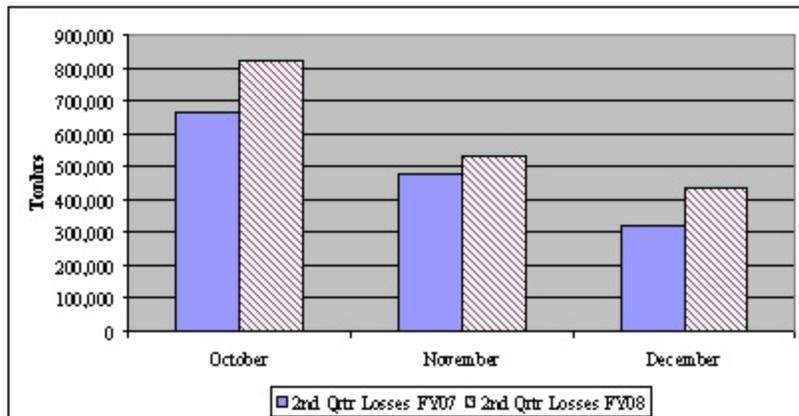


Figure 3. Second Quarter Chilled Water Energy Losses

The mass loss to the EDS is reflected in the amount of city water make-up (MU) to the system. A decrease in the mass loss is noted with a comparison between the Second Quarter data for FY07 and FY08 of approximately 36%. A slight increase in the amount of city water make-up to the cooling towers is present in the

comparison of Second Quarter data as shown in Figure 4. The total cooling tower make-up increased by approximately 9%.

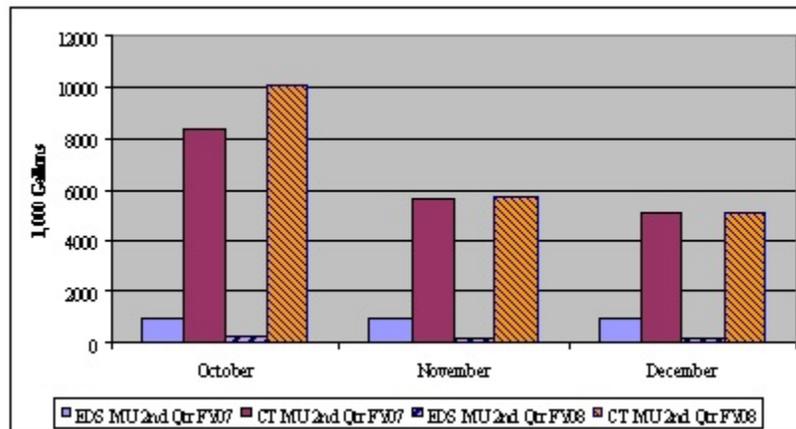


Figure 4. Second Quarter Chiller Plant City Water Make-up

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 approximately 5 cycles throughout the quarter. This relatively high level could be indicative of a relatively “clean” condensing water system.

3. Performance

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

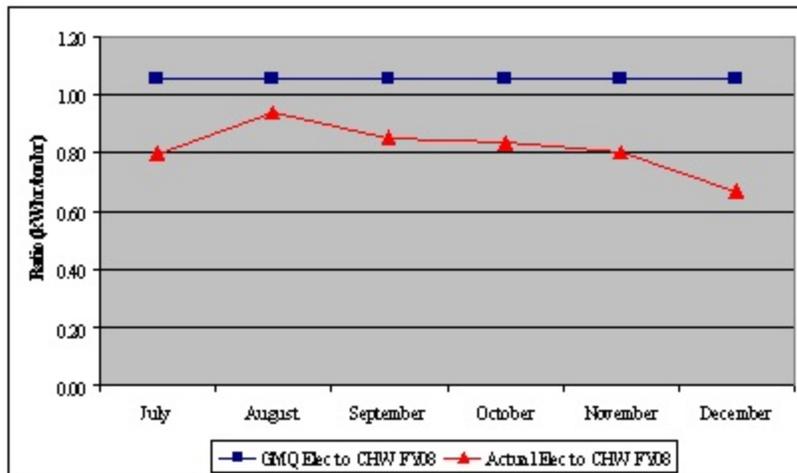


Figure 5. Chilled Water Plant Electric Performance Guarantee Comparison

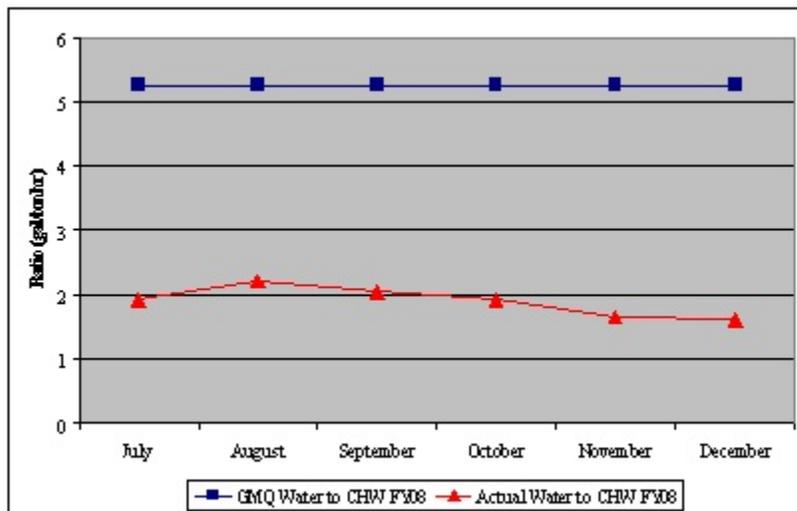


Figure 6. Chilled Water Plant Water Consumption Performance Guarantee Comparison

The chilled water allocation of the electric consumption falls under the GMQ limit of 1.055 kWhr per tonhr for the current quarter. The electric usage for the current quarter is approximately 6% less than in the Second Quarter for FY07. Also, the actual chilled water plant water conversion factor is approximately 6% less than in the Second Quarter of FY07.

B. Steam

1. Sales and Sendout

The steam sendout decreased by approximately 20% for the current quarter over the previous Second Quarter (FY07), and the sales decreased by approximately 25%. Steam system losses were approximately 16% of the sendout compared to approximately 12% from the previous Second Quarter. There were 6% fewer heating degree days this quarter. A comparison for the Second Quarter steam sales is shown in Figure 7.

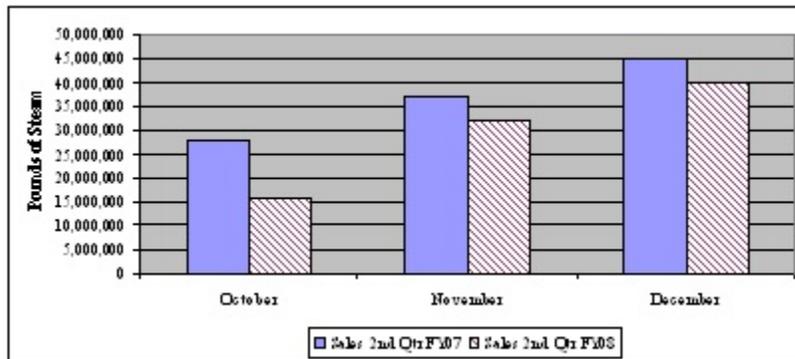


Figure 7. Second Quarter Steam Sales Comparison

Figure 8 shows the steam sales, sendout and losses for the fiscal-year-to-date. 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.

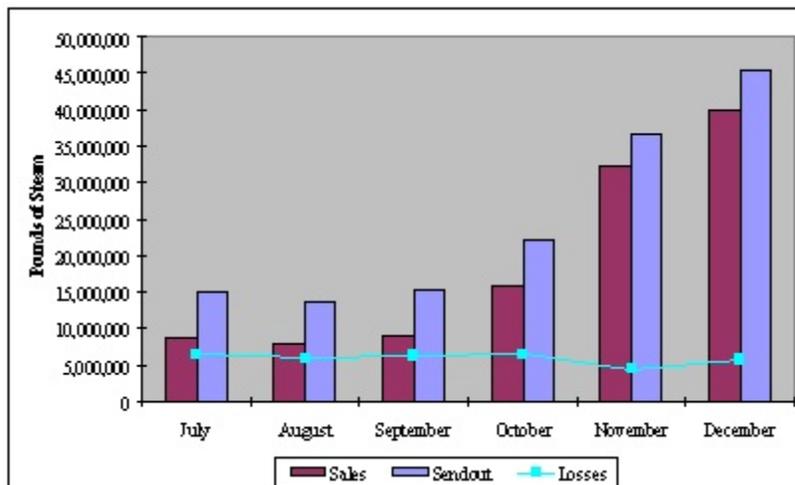


Figure 8. Steam Sales, Sendout and Losses for FY08

The peak steam demand for the current quarter is 100,156 pounds per hour and equates to an approximate 22% decrease in demand over the previous Second Quarter. The heating load factor for the current quarter, relative to sendout, is approximately 47% and reflects an increase in the heating load factor from the previous Second Quarter of approximately 2.5%.

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 slightly more than in FY07.

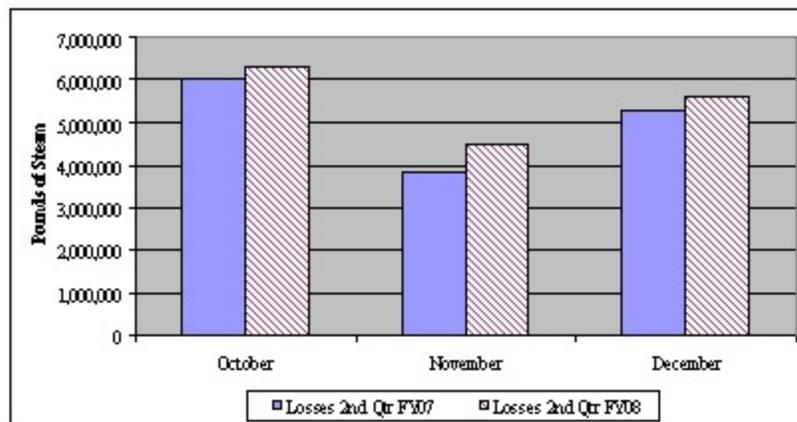


Figure 9. Second Quarter Comparison of the Steam Losses Between the EGF and the Customers

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. A considerable decrease in the mass loss is noted with a comparison between the Second Quarter data for FY07 and FY08 of approximately 141%, due largely to an increase in the amount of condensate return to the EGF. This data is shown in the comparison of Second Quarter data in Figure 10.

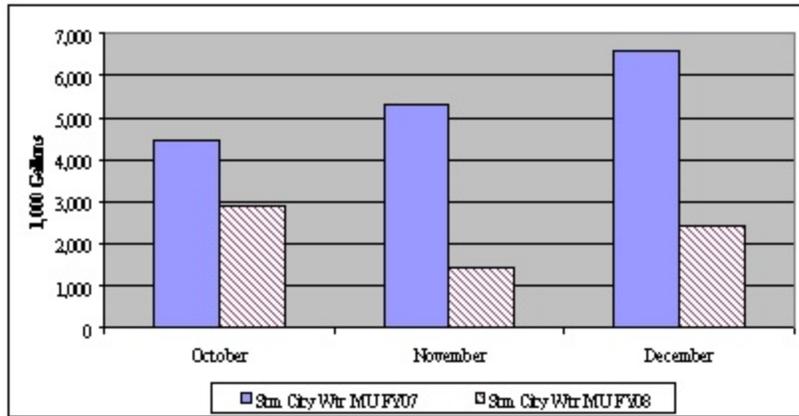


Figure 10. Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system aspect of the EGF is presented by the following three charts, Figures 11, 12 and 13. Under the management of CNDE, the System Performance Guarantee levels as described in the ARMA are being achieved quite satisfactorily except for excursions in the water and electric consumptions throughout the quarter. The fuel consumptions remain below the GMQ for the quarter. The electric usage for the current quarter is approximately 12% greater than in the Second Quarter for FY07.

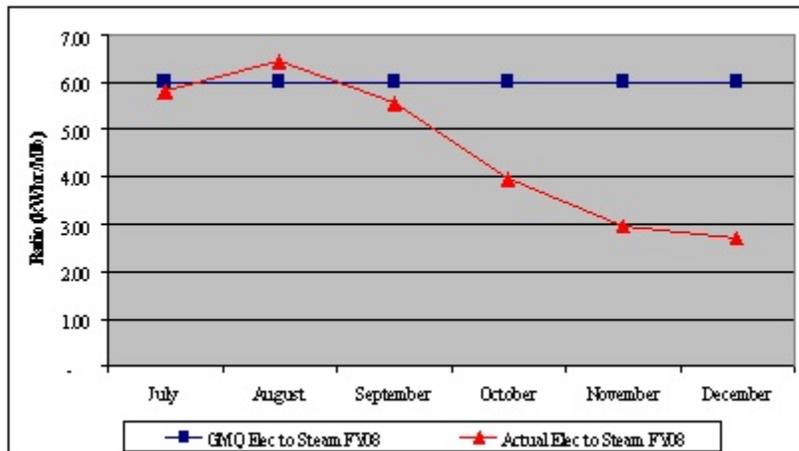


Figure 11. Steam Plant Electric Performance Guarantee Comparison

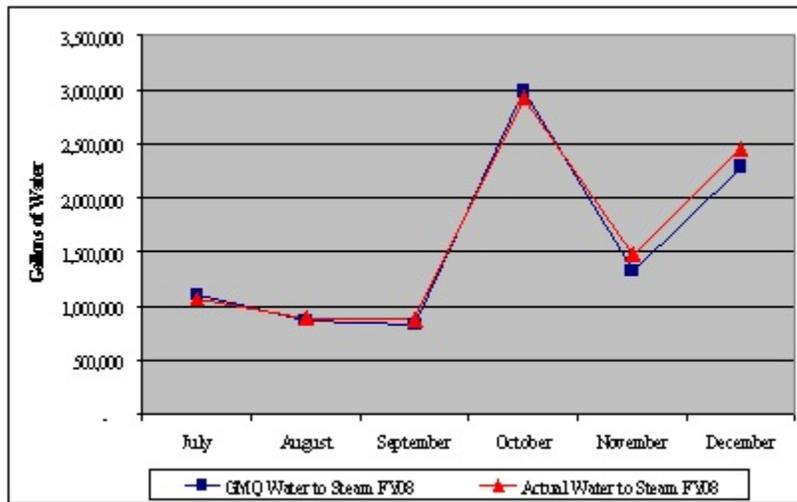


Figure 12. Steam Plant Water Consumption Performance Guarantee Comparison

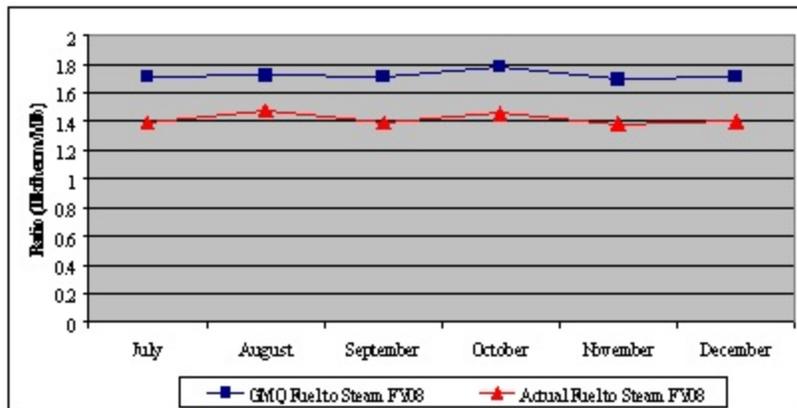


Figure 13. Steam Plant Fuel Consumption Performance Guarantee Comparison

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. EGF Production and Sales Performance Comparison

	Unit	Second Quarter FY08	Second Quarter FY07	*Percent Difference	First Half FY08	First Half FY07	*Percent Difference
	days	92	93	-1.09%	184	184	0.00%
Total Electric Use	kWhrs	9,480,610	9,732,803	-2.66%	29,204,925	29,812,539	-2.08%
Chilled Water	kWhrs	9,215,043	9,441,368	-2.46%	28,788,348	29,366,725	-2.01%
Steam	kWhrs	265,567	291,435	-9.74%	416,577	445,814	-7.02%
Total Water Use	kgal	28,077	38,306	-36.43%	81,796	93,777	-14.65%
Total Chilled Water	kgal	21,280	21,916	-2.99%	72,188	70,022	3.00%
EDS Make-up	kgal	482	2,911	-503.94%	4,715	5,645	-19.72%
Cooling Towers	kgal	20,798	19,005	8.62%	67,473	64,377	4.59%
Calc. CT Evaporation	kgal	16,814	NA	NA	55,830	NA	NA
CT Blowdown	kgal	3,984	NA	NA	11,643	NA	NA
Calc. # Cycles		4.22	NA	NA	4.80	NA	NA
Steam	kgal	6,797	16,390	-141.14%	9,608	23,755	-147.23%
Total Fuel Use	mmBTU	146,111	180,198	-23.33%	208,455	262,647	-26.00%
Natural Gas	mmBTU	146,050	180,042	-23.27%	208,394	262,466	-25.95%
Propane	mmBTU	61	156	N/A	61	181	-196.72%
Condensate Return	kgal	7,049	9	99.87%	10,013	13	99.87%
	bs	57,491,402	72,318	99.87%	81,667,788	109,466	99.87%
Avg Temp	°F	164.3	155.7	5.27%	170.7	155.3	8.98%
Sendout							
Chilled Water	tonhrs	13,645,600	12,964,500	4.99%	38,985,200	38,538,100	1.15%
Steam	bs	104,217,000	124,853,000	-19.80%	148,207,000	182,308,000	-23.01%
Peak CHW Demand	tons	14,600	14,800	-1.37%	17,400	17,300	0.57%
Peak Steam Demand	lb/hr	100,156	121,750	-21.56%	100,156	121,750	-21.56%
CHW LF		42.33%	39.25%	7.28%	50.74%	50.44%	0.58%
Steam LF		47.13%	45.94%	2.51%	33.51%	33.91%	-1.19%
Sales							
Chilled Water	tonhrs	11,853,813	11,501,964	2.97%	34,466,336	34,020,275	1.29%
Steam	bs	87,810,007	109,709,396	-24.94%	113,314,131	149,501,517	-31.94%
Losses							
Chilled Water	tonhrs	1,791,787	1,462,536	18.38%	4,518,864	4,517,825	0.02%
Steam	bs	16,406,993	15,143,604	7.70%	34,892,869	32,806,483	5.98%
		15.74%	12.13%	22.96%	23.54%	18.00%	
Degree Days							
CDD		123	67	45.53%	1,614	1,315	18.53%
HDD		1,126	1,197	-6.31%	1,126	1,212	-7.64%

*positive percent difference values imply an increase from FY07 to FY08

Table 2. GMQ Calculations and Performance Guarantees

GMQ Calculations	Unit	Second Quarter FY08	Second Quarter FY07	*Percent Difference	Total Year FY08	Total Year FY07	*Percent Difference
Steam							
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00		6.00	6.00	
Electric Conversion	kWhr/Mlb	3.02	2.66	12.16%	3.68	2.98	18.89%
GMQ Plant Efficiency	Dth/Mlb	1.728	1.781		1.721	1.781	
Plant Efficiency	Dth/Mlb	1.402	1.443	-2.95%	1.407	1.441	-2.43%
Actual %CR		55.17%	0.06%	99.90%	55.10%	0.06%	99.89%
Avg CR Temp	°F	164	156	5.27%	171	155	8.98%
GMQ Water Conversion	gal	6,588,453	17,594,461		9,382,234	25,690,555	
Water Conversion	gal	6,864,970	16,553,900	-141.14%	9,704,514	23,992,550	-147.23%
Chilled Water							
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055		1.055	1.055	
Electric Conversion	kWhr/tonhr	0.777	0.821	-5.59%	0.835	0.863	-3.35%
GMQ Water Conversion	gal/tonhr	5.25	5.25		5.25	5.25	
Water Conversion	gal/tonhr	1.80	1.91	-6.14%	2.09	2.06	1.73%

*positive percent difference values imply an increase from FY07 to FY08

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 2007. Communication between TEG and CNDE has proven 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 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.

- On October 1, boiler 1 tripped due to a failed level control switch. The trip caused the steam pressure to drop to a minimum of 130 psig, but header pressure was restored in approximately one hour.
- The steam system was shut down for an emergency steam outage on October 19 to replace a leaking isolation valve in Manhole K. The system returned to normal operating pressure within approximately nine (9) hours after shut-down.

- A few electrical and controls issues caused momentary equipment trips at the EGF during the quarter. The resulting down-times were brief, and CNDE responded quickly to remedy the problems.

B. Efficiency

The operation of the EGF satisfied the guaranteed levels for all commodity usage except for the water usage to the steam plant. These values were recorded higher than the allowable level during the months of November and December. A more detailed discussion of the contract guarantee performance was presented previously in this report.

C. Environment, Health and Safety

The annual and semi-annual emissions monitoring reports were completed and submitted as required. 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. One reportable accident occurred during December, but the employee sought medical treatment and returned to work.

Monthly safety meetings were conducted by HazMat, Inc.

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

During the Second Quarter, TEG requested that CNDE provide regular reports regarding the water treatment program at the EGF and for the EDS. This request was made since the bulk of investment by the Metropolitan Government of Nashville and Davidson County is in the distribution system and the longevity of the EDS is largely a function of the quality of water treatment. CNDE agreed and responded by incorporating a section in their monthly reports on this subject starting in October 2008.

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 buildings will begin in January 2008 to monitor the concentration and distribution of the steam system chemicals.

- **Steam System**
 - The softener resin was found to be 80% coated and contained a higher moisture content than recommended in October. Replacement resin was purchased but not installed since some changes in operation during November and a decrease in the city water chlorine levels improved the softeners' performance during the quarter. Chemtreat, Inc. has recommended the installation of new quills and a pump to inject sulfites into the city water make-up line to reduce the chlorine levels.
 - The condensate return to the EGF from the EDS was drained into the tunnel for most of the month of October due to an increase in the hardness levels. Upon investigation, CNDE determined that the increase in hardness was due to the hot water leaking into the condensate system at several customers' steam to hot water heat exchangers. CNDE requested that these customers isolate these heat exchangers and use other ones until the sources of the leaks could be repaired.
- **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.
 - Biological growth in the system continues to be excellent with less than 1,000 count per milliliter reported in October.
- **Chilled Water System**
 - The system control and chemistry continues to be excellent.
 - Corrosion coupons were changed out in December with no evidence of corrosion, deposition or biological growth.

G. Maintenance and EGF Repairs

CNDE continues to report on the numerous 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 annual chiller tube cleaning began in December.
- Minor repairs were made on the chemical feed and monitoring system, the condensate return pumps and the boiler instrumentation.

- The drive belt for cooling tower #18 was replaced.
- The burner air flow pressure differential pressure switch was replaced on boiler 4.
- Other minor items were presented in the CNDE monthly reports.

H. EGF Walk-through

A quarterly Walk-through of the EGF was performed on January 15 by Kevin Jacobs, P.E. and Dwayn Draper of TEG. This review involved a tour of the facility with the primary points of interest and concern noted herein.

- CNDE and Trane personnel were cleaning the tubes on the evaporators for chillers 1, 2 and 5. During this cleaning process, a significant amount of water was present in the main chiller plant aisle way. However, CNDE were in the process of cleaning the area.
- Some oxidation was noticeable on a few of the chiller tubes (for those chillers undergoing cleaning). Some tubes appeared to be relatively new.
- The seal on the feedwater pump #2 was leaking slightly and dripping hot water into the drip tray.
- Ice was observed in the cooling tower basins and hanging from the cooling tower fill. CNDE personnel indicated that the cooling towers were inspected twice per shift by the operators during their daily walk-throughs. The basin heaters were recently inspected and determined to be operating correctly. To reduce the formation of ice in the cooling towers, eight towers were recently drained of water. These towers will be re-filled in the spring.
- The hinges on the gate in the stair way next the EGF conference room are loose, and the anchor bolts are pulling out from the wall. CNDE have repaired this hinge several times in the past and plan to repair it again within the next few weeks.
- Numerous cracks in the outside concrete walls remain. No additional work has been performed on these cracks.
- 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.

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. The status of scheduling of the projects are discussed, and the end of quarter cost status is also presented.

A. Second Quarter FY08 Open Projects

The following projects remained open at the end of the Second Quarter of FY08.

1. DES 021 - Customer Metering (Metro Owned)

The Work relating to this project is complete, and CNDE began operating under the terms of the ARMA on April 1, 2007. Additional work was required at the Municipal Auditorium. This work was completed during the quarter and the balance of the project is expected to be completed during the Third Quarter.

2. DES 022 - Customer Metering (Privately Owned)

The Work relating to this project is complete, and CNDE began operating under the terms of the ARMA on April 1, 2007. Additional work was required at the Wildhorse Saloon. This work was completed during the quarter and the project is expected to be closed out during the Third Quarter.

3. 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 FY08. This project will remain open.

4. DES041 - Symphony Condensate Repair

The discharge of the condensate return from Manhole B4, originating from the Symphony building, was reported to have damaged some sewer piping near the manhole. TEG completed its preliminary evaluation of the options to this system and determined that, based on the recovery of condensate from the Symphony and from the driplegs located in the three manholes along the route, a suitable payback should exist to install a condensate return line from Manhole B4 to Manhole B. This new line would enable the recovery of the condensate from the Symphony. Therefore, TEG has begun the design of this condensate line.

Subsequent to TEG's preliminary evaluation, bids from other capital projects were received by TEG with pricing much higher than expected. Due to the magnitude of these prices, TEG is now re-visiting its evaluation of alternatives. Parallel with this effort, TEG will complete the design documents and entertain bids in order to determine construction pricing. Additional evaluation of alternates and bids for a new condensate line should be completed during the Third Quarter.

5. DES042 - Regions Bank Condensate Line Repair

Due to a previous failure, the condensate line between Manholes 3 and 4 was isolated, and the condensate from the steam traps in MH 4 was piped into the Regions Bank building where it was drained to the sewer. The condensate line into the Regions Bank has collapsed and is in need of replacement. Economic evaluations were performed regarding the repair of the condensate line between MH 3 and 4 to return the condensate to the EGF. Since a favorable payback does not exist to restore this condensate line and return the condensate to the EGF, the service line to the Regions Bank building must be replaced in order to drain the condensate from the dripleg in MH 4. The design of these modifications were completed and bids were requested during the Second Quarter FY08. Bids will be received early in the Third Quarter and work will take place during the same quarter.

6. 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. The design of the modifications for this project are underway and expected to be completed during the Third Quarter.

7. 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, indicates that the line is in poor condition. This section of the condensate main receives condensate from two customers: the Sheraton Hotel and the Hermitage Hotel. 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. In an attempt to avoid a total failure of this section of the condensate system, this repair is included in the capital projects for FY08. The design of the modifications for this project are underway and expected to be completed during the Third Quarter.

8. 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. Because of the actual length of this service line, the return on the capital cost does not support the replacement this line. Therefore, this project will focus on the installation of a condensate tempering and disposal system to the sewer system. The evaluations for the options and alternates for this project have begun and are expected to be completed during the Third Quarter. Once these options have been evaluated, a course of action will be selected and design will ensue.

9. DES047 - State Steam Tunnel Condensate Line Replacement

Approximately 1,000 feet of the condensate line located in the State steam tunnel has been distorted due to expansion joints that are no longer functioning properly and require replacement. Approximately 60 feet of this line was replaced during the last fiscal year leaving 940 feet of piping still needing replacement. The evaluations for the options and alternates for this project will begin in the Third Quarter FY08.

10. 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 this fiscal year.

Currently CEPS is evaluating the structural aspects of the tunnel through a third-party contractor. A preliminary evaluation was completed during the Second Quarter FY08. Additional engineering and design has been recommended and these recommendations are currently under review.

11. DES049 - Temporary Boiler Connection

Through the City of Nashville's evaluation of emergency planning, it was determined that there is a need to be able to supply heating to the inmates housed in the Metro Criminal Justice Center and Courthouses. Therefore, this project will install emergency connections in an existing manhole to allow a temporary boiler to be connected to the distribution system. The evaluation for the options and alternates for this project has begun and should be completed during the Third Quarter FY08.

12. 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 itself. The required work within these manholes has been prioritized, and a standard specification has been completed. The receipt of bids for the repair and replacement of insulation in the higher priority manholes should begin during the Third Quarter FY08.

The Work associated with this project will be ongoing as required. Manhole D is the first manhole to be addressed under this project, and work in this manhole commenced during the Second Quarter FY08.

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

An expansion joint on the condensate return line in the 4th Avenue Tunnel has experienced recurring leaks. This project will evaluate the reason for these leaks and will replace the damaged expansion joint. The evaluations for the options and alternates for this project will begin during the Third Quarter FY08.

14. 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 will also require replacement in the very near future. TEG completed the design for these modifications and bids were solicited for this project during the Second Quarter. Bids will be received early in the Third Quarter and, due to public activities scheduled for the spring and summer of 2008 in the area, all work (that has been approved to proceed) must be completed prior to May 1.

B. Second Quarter FY 08 Closed Projects

1. DES035 - Condensate Line Replacement from MH 5 to 6

The additional insulation required in MH 6 was completed during the First Quarter FY08. All Work associated with this project is complete. The closeout documentation has been received.

2. DES040 - EDS Tunnel Lighting Rehabilitation Phase II

Work on this project was completed during the First Quarter FY08. A punchlist was created, and CNDE reports that all punchlist items have been addressed.

C. Capital Projects Budget

The following table in summarizes the reported expenditures and remaining balance of the DES capital projects based on reported expenditures at the end of the Second Quarter FY08. Open projects or completed projects that require some additional management are shown. Projects that were closed during FY07 or in this quarter are shown with a gray highlight. The total, historic budget and expenditures of the 2002A Bond are not shown; the values shown reflect the more recent projects and expenditures.

Table 3. Bond Project Budget Summary

	DES Project #	Description	Total Budget	Total Spent to Date	Remaining Balance
2002A Bond Projects					
	DES017	TN Tower Decoupling	\$ 1,350,422.00	\$ 1,277,926.14	\$ 72,495.86
		Interest Earned	\$ -	\$ (4,378.82)	\$ 4,378.82
		Total Closed Projects	\$ 2,377,280.59	\$ 2,377,280.59	\$ -
		Total 2002A Bond	\$ 3,727,702.59	\$ 3,650,827.91	\$ 76,874.68
2005B Bond Projects					
	DES020	Renaissance Decoupling	\$ 538,818.00	\$ 576,306.82	\$ (37,488.82)
	DES004,021,022	Customer Metering	\$ 1,676,439.40	\$ 1,766,412.48	\$ (89,973.08)
	DES042	Regions Cond Line Replacement	\$ 320,000.00	\$ 18,803.04	\$ 301,196.96
	DES018	Library Connection	\$ 767,151.00	\$ 767,149.11	\$ 1.89
	DES019	Symphony Connection	\$ 2,470,924.00	\$ 2,489,765.65	\$ (18,841.65)
	DES027	Viridian Connection	\$ 1,546,969.00	\$ 1,611,435.27	\$ (64,466.27)
		Project Development	\$ 866,710.03	\$ 315,570.26	\$ 538,648.80
		Total 2005B Bond	\$ 8,187,011.43	\$ 7,557,933.61	\$ 629,077.82
2007 Bond Projects					
	DES024B	MH 18 to L Steam/Cond	\$ 818,206.00	\$ 997,287.62	\$ (179,081.62)
	DES029	Tn Tower Cond Line	\$ 317,031.00	\$ 339,029.99	\$ (21,998.99)
	DES035	MH 5 ot MH 6 Cond Line	\$ 489,688.00	\$ 491,402.54	\$ (1,714.54)
	DES037	JK Polk Cond Line	\$ 413,123.00	\$ 456,217.87	\$ (43,094.87)
	DES040	Tunnel Lighting Ph II	\$ 152,551.00	\$ 153,074.50	\$ (523.50)
	DES034	State Tunnel Communications	\$ 20,500.00	\$ 20,509.00	\$ (9.00)
	DES038	Wachovia Cond Line	\$ 83,016.00	\$ 83,016.00	\$ -
	DES039	2" State Cond Line	\$ 80,233.00	\$ 80,233.01	\$ (0.01)
		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					
	DES044	MH 5 to MH 9 Cond Line	\$ 550,000.00	\$ 1,080.07	\$ 548,919.93
	DES045	MH 6 to MH 23 & Sheraton CND Lines	\$ 700,000.00	\$ 1,248.19	\$ 698,751.81
	DES046	Ryman Auditorium Cond Line	\$ 150,000.00	\$ 56.42	\$ 149,943.58
	DES047	State Steam Tunnel	\$ 325,000.00	\$ -	\$ 325,000.00
	DES048	Tunnel Lighting & Elec Ph III	\$ 90,000.00	\$ -	\$ 90,000.00
	DES049	Temp Boiler Connection MH 15	\$ 93,500.00	\$ -	\$ 93,500.00
	DES050	MH & Tunnel Insul Repair	\$ 100,000.00	\$ 617.97	\$ 99,382.03
		Tunnel & MH Access Mod	\$ 220,000.00	\$ -	\$ 220,000.00
	DES051	Exp It Replace at 4th Ave Tunnel	\$ 20,000.00	\$ -	\$ 20,000.00
	DES052	Wildhorse Sm & Cond	\$ 130,000.00	\$ 17,412.96	\$ 112,587.04
		Closed Projects Sub-total	\$ -	\$ -	\$ -
		Metro Project Admin	\$ -	\$ -	\$ -
		Project Man, Development, etc	\$ 370,000.00	\$ -	\$ 370,000.00
		Total 2008 Bond	\$ 2,748,500.00	\$ -	\$ 2,728,084.39

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 design continued during the quarter on the 4th Ave Tunnel exhaust fan. Work on this project has been complicated by the fact that the existing fan can not be repaired, and a replacement fan can not physically fit into the tunnel without the removal of a vault roof. Therefore, the structural and mechanical a design for the replacement of this fan with two smaller fans was completed during the Second Quarter of FY08 with the electrical design to be completed early during the Third Quarter and bids will be received during this same quarter.
- The remaining value of the R&I budget at the end of the Second Quarter FY08 is \$315,658. Table 4 provides a summary of the FY08 expenditures and revenues associated with the R&I budget.

Table 4. FY08 Repair and Improvement Expenditures and Balance

Description	Date	Tracking #	Vendor	Expenditure	Transfers	Net Market Adjustment	Market Value	Balance
"Market Value" and "Cost Value" at end of FY07						\$ 412.07	\$ 277,953.63	\$ 276,541.56
DES 432 Replace 4 "Condensate Expansion Joint	08/15/07		CEPS	\$ 14,850.00				
DES 442 MH-B2, B3, B4 and Expansion Joint Replacement	08/27/07		IEG	\$ 3,732.91				
DES 441 Manhole B2, B3, B4, Expansion Joint Replacement and 4th Avenue Tunnel Vent for period of 8/5/07 - 9/1/07	09/1/07		IEG	\$ 4,447.57				
MH-B2, B3, B4 and Expansion Joint Replacement	10/15/2007	DES-481	IEG	\$ 5,333.39				
Sub-Total First Quarter FY08				\$ 30,563.87	\$ 60,372.51	\$ (390.92)	\$ 29,397.72	\$ 29,788.64
Manhole B2, B3, B4, and 4th Avenue Tunnel Vent for period of 9/5/07 - 11/5/07	11/1/07	DES-704	IEG	\$ 5,354.85				
Manhole B2, B3, B4, and 4th Avenue Tunnel Vent for period of 11/4/07 - 12/1/07	12/7/2007	DES-721	IEG	\$ 10,298.77				
NDES Emergency Steam Outage 10/20/07	12/21/2007	DES-737	CEPS	\$ 9,110.54				
MWS - Recovery cost for the DES Compliance Project	1/7/2008	DES-738	MWS	\$ 24,578.84				
Sub-Total Second Quarter FY08				\$ 51,343.00	\$ 60,372.51	\$ 175.03	\$ 9,204.54	\$ 9,029.51
<i>insert first item third quarter this row</i>								
Sub-Total Third Quarter FY08				\$ -	\$ -	\$ -	\$ -	\$ -
<i>insert first item fourth quarter this row</i>								
Sub-Total Fourth Quarter FY08				\$ -	\$ -	\$ -	\$ -	\$ -
FY 08 Year to Date				\$ 81,926.87	\$ 120,745.02	\$ (215.89)	\$ 316,555.89	\$ 315,658.17

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. A preliminary evaluation was completed by a geotechnical consultant during the Second Quarter and the associated recommendations will be evaluated and further action developed during the Third Quarter.
- State Tunnel Inspections: CNDE advises the replacement of expansion joints, valves, condensate piping and steam trap assemblies.
- The determination of the energy consumptions based on monthly bills for a number of customers required reviews of their meter installations. In each case, the meters were determined to be operating properly.
- Several minor repairs were made to some of the systems within the mechanical rooms at some customer's buildings.
- "No Trespassing" signs were installed at Manhole 22 at the request of the Metro Police Department due to the frequent incursions by unauthorized personnel into the 7th Avenue tunnel. The anchor bolts securing the grating over the exhaust fan discharge near MH 22 were broken, thus allowing entrance into the tunnels. Steel grating was recently installed and welded in-place to provide more security at this potential entrance.
- The anchor bolts securing the steam slip joint anchor in Manhole B4 have recently broken. TEG has developed and issued a design for the modification of the anchors to remedy this situation. Repair work should be performed in this manhole during the Third Quarter FY08.
- The thermographic review of the EDS revealed an expansion in the "hot spots" near the Sheraton Hotel in November. Additional inspections of the EDS revealed another new "hot spot" in the system at 5th and Deaderick.
- Other minor items are included in the CNDE monthly reports.

C. Emergencies

An emergency steam outage occurred on October 19 due to a serious steam leak on the system isolation valve in Manhole K near the Wildhorse Saloon. The steam system was initially shut-down at 11:00 pm and restarted in the early hours of October 20. The system pressure was back to normal (150 psig) by 7:40 am.

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

D. EDS Walk-through

Since the majority of Nashville's investment in the district heating and cooling system is in the distribution system, TEG provides quarterly "walk-throughs" of this system. CNDE inspects all of the manholes on a monthly basis, and TEG has made arrangements to accompany CNDE during the manhole inspections once every quarter. Items which are reviewed during these inspections include the following: the presence of water in the vaults, any type of piping or piping component leaks (such as expansion joints, flanges, valves, traps, etc.), the condition of piping to wall seals, condition of piping and component insulation, condition of any structural components, overall condition of the manhole and any other deficiency or safety related item which requires attention.

The walk-through for the Second Quarter was made by Jon Belcher, P.E., of TEG, on January 23, 2008. The following comments and observations are a result of this walkthrough:

- Housekeeping
 - Generally, the manholes which were reviewed were in good order. However, Manholes 1, 15 and 23 have a fair amount of debris consisting primarily of old insulation which has either fallen off of the piping or was left from work that was done in the manhole. The remaining manholes visited were reasonably clean.
- Water Infiltration
 - Due to surface and groundwater, several of the manholes require pumping before an inspection can be conducted. This water infiltration is an on-going problem, and it is very difficult to prevent it from occurring. As a result, CNDE pumps out manholes that contain water on a monthly basis.
- Manhole 1
 - The entry ladder in this vault requires replacement.
 - There is a fair amount of debris and pipe insulation on the manhole floor that requires removal.
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - A corroded anchor base needs to be re-enforced or replaced.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 2
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - The ladder in this manhole needs to be inspected to determine if it requires replacement.

- Some of the steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 3
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 5
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 6
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 6A
 - There is some minor debris in this vault that requires removal.
 - All manhole piping needs to be insulated. This manhole is on an insulation repair/replacement list.
- Manhole 9
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 11
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 13
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - Plans will be developed for the eventual replacement of a 16" steam isolation valve and an 8" condensate isolation valve.
 - This manhole has a significant amount of mud present in the floor.
 - The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole 15
 - There is some debris in this vault that should be removed, old insulation and lagging, debris, etc.

- Manhole 23
 - There is some debris in this vault that should be removed, old insulation and lagging, insulation blanket(s), trash, debris, etc.
 - Some manhole piping insulation needs to be replaced or installed. This manhole is on an insulation repair/replacement list.
 - Some of the steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion.
- Manhole U
 - The pavement above this manhole has been damaged due to excessive heat. The steam pipe in the manhole was not insulated so insulation has been added to this pipe, however the vault still remains warm. The cause of the elevated vault temperature requires further investigation.
 - Some structural failure to the walls of this vault requires further investigation and possible repair.
- Wildhorse Manhole
 - Some manhole piping insulation needs to be replaced or installed.
 - This manhole may be abandoned with the possible installation of new services lines to the Wildhorse.

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.

A. Marketing

- The CNDE Marketing Plan continues to be “a work-in-progress” during the quarter.
- The Ragland Properties along Molloy Street and between 1st and 3rd Avenues is currently being investigated as a potential new customer. This property could represent an additional 150 tons and 1,000 pounds per hour addition to the system.
- TEG remains in contact with the potential service for the Westin Hotel to be constructed south of Broadway Avenue.

B. Customer Interaction

- TEG and CNDE personnel met with the Renaissance Office Complex personnel to discuss and review the operation of their chilled water pumps.
- The biannual customer meeting occurred on October 18. TEG presented the FY08 budget and capital projects.
- TEG and CNDE met with personnel from the Wildhorse Saloon to discuss the work relating to their steam and condensate piping at Manhole K.

- A meeting was held on October 9 between CNDE, TEG and Bruce White from the Sheraton Hotel to discuss the proposed modifications to chilled water system at his building.
- A failure of the PRV at the Wildhorse Saloon prompted building personnel to contact CNDE to inform them that they may have exceeded their contract steam demand for November.
- The TCV at the Sun Trust Bank building was adjusted due to reported cooling problems with this building. The signal cable to the C-Tech panel at this building was also repaired.
- Nashville Convention Center personnel reported problems with their TCV on December 17. Upon investigation, it was determined that the valve was not seating correctly. NCC began repairs in December, but the work was not completed during the quarter.
- 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.
- 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.
- Existing minor leaks within the manholes need to be reviewed and repaired.
- Painting of structural steel within manholes to reduce or eliminate corrosion needs to begin as an ongoing maintenance item.
- Insulation which is either not present or in disrepair within the manholes needs to be addressed through either capital projects which include work within these manholes or through DES 050.
- Potential safety hazards, such as the condition of ladders, within some of the manholes need to be addressed.
- CNDE should continue to remove any debris present in the manholes as inspections and schedules allow.