

# Engineering Consultant's Report

on the  
Operation and Maintenance  
of the Electric System  
Fiscal Year 2014



**City of Dover, Delaware**

**Project No. 85685**

**06/18/2015**

# **Engineering Consultant's Report**

prepared for

**City of Dover, Delaware  
Dover, Delaware**

**Project No. 85685**

**06/18/2015**

prepared by

**Burns & McDonnell Engineering Company, Inc.  
Kansas City, Missouri**

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June 18, 2015

Ms. Donna S. Mitchell, CPA  
Controller/Treasurer  
City of Dover  
5 East Reed Street  
Weyandt Hall, Suite 300  
Dover, Delaware 19901

Re: Engineering Consultant's Report  
Project No. 85685

Dear Ms. Mitchell:

In compliance with the requirements of Section 705 and Section 504 of the City of Dover, Delaware Resolution Authorizing and Securing Electric Revenue Bonds, adopted December 23, 1985 (Resolution), Burns & McDonnell presents this Annual Engineering Consultant's Report on the Operation and Maintenance of the Electric System for the fiscal year ended 2014. This report summarizes our review and assessment of the City of Dover's (City) Electric System, its existing retail electric rates, its insurance coverage in effect, and its reserve funds. Financial, statistical, and operating data used in preparing the report were initially reported in the City's annual financial statements and accounting records. Additional information was furnished by City and Electric Division staff.

In the preparation of this Engineering Consultant's Report, Burns & McDonnell completed assessments of the electric generating stations and the transmission and distribution system of the City's Electric Division. Assessments involved interviews, observations, and review of fiscal year 2014 expenditures and fiscal year 2015 budgets. In addition, an analysis of the balances of the Improvement and Extension Fund as well as other funds supporting the Electric Division was performed. Burns & McDonnell also reviewed the adequacy of revenues provided by current retail rates in relation to the requirements of the Resolution. Finally, a high-level assessment of the City's insurance coverage related to the Electric Division was completed.

Based on these reviews and assessments, it is the opinion of Burns & McDonnell that the Electric System is being operated and maintained, including replacements and upgrades as appropriate, in a manner that is consistent with current electric utility practices. In addition, the current retail rates have provided sufficient revenues to satisfy the debt service coverage requirement in the Resolution. Further, it is the opinion of Burns & McDonnell that the balances in the various reserve funds maintained by the City for the Electric Division are sufficient for their intended purposes.



We appreciate the cooperation and assistance provided by the City and the Electric Division staff in the preparation of this report. We will be happy to discuss the report with you at your convenience.

Sincerely,  
Burns & McDonnell

A handwritten signature in black ink, appearing to read "Ted J. Kelly". The signature is fluid and cursive, with a prominent loop at the end of the last name.

Ted J. Kelly  
Principal & Senior Project Manager  
Business & Technology Services

TJK/glb

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**LIST OF ABBREVIATIONS**

<b><u>Abbreviation</u></b>	<b><u>Term/Phrase/Name</u></b>
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
City	City of Dover, Delaware
DCS	distributed control system
EDQP	Employee Development and Qualification Program
EIA	U.S. Energy Information Administration
FY	Fiscal Year
GWh	gigawatt-hour
I&E Fund	Electric Improvement & Extension Fund
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
LAN	local area network
McKee Run	McKee Run Generating Station
MW	megawatt
MWh	megawatt-hour
NAES	North American Energy Services Corporation
NERC	North American Electric Reliability Corporation
NRG	NRG Energy Center
Ohm	standard unit of electrical resistance
PJM	Pennsylvania New Jersey Maryland Interconnection
Report	2014 Engineering Consultant's Report on the Operation and Maintenance of the Electric System
Resolution	Resolution Authorizing and Securing Electric Revenue Bonds, adopted December 23, 1985



VanSant	VanSant Generating Station
TEA	The Energy Authority, Inc.

## STATEMENT OF LIMITATIONS

In preparation of the Annual Engineering Consultant's Report on the Operation and Maintenance of the Electric System for the fiscal year ended 2014 (the Report), Burns & McDonnell relied upon information provided by the City of Dover, Delaware (the City). The information included various analyses, computer-generated information and reports, audited financial reports, and other financial and statistical information, as well as other documents such as operating budgets and current retail electric rate schedules. While Burns & McDonnell has no reason to believe that the information provided, and upon which Burns & McDonnell has relied, is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee its accuracy or completeness. In addition, Burns & McDonnell has used the information provided to make certain assumptions with respect to conditions that may exist in the future. While Burns & McDonnell believes the assumptions made are reasonable for the purposes of the Report, it makes no representation that the conditions assumed will occur.

## **1.0 – EXECUTIVE SUMMARY**

## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The Fiscal Year 2014 Engineering Consultant's Report on the Operation and Maintenance of the Electric System (Report) has been prepared in compliance with the requirements of the City of Dover, Delaware Resolution Authorizing and Securing Electric Revenue Bonds, adopted December 23, 1985 (Resolution). Burns & McDonnell was retained as the Engineering Consultant by the City of Dover, Delaware (City) to complete an inspection of the Electric System and prepare a report on findings. The Resolution requires that the Engineering Consultant complete the following:

*“The City covenants that it will cause the Engineering Consultants employed under the provisions of Section 705 of this Resolution . . . to make an inspection of the Electric System at least once each fiscal year and . . . to submit to the City Manager a report setting forth (a) their findings whether the properties of the Electric System have been maintained in good repair, working order and condition and whether they have been operated efficiently and economically and (b) their recommendation as to*

*(i) the proper maintenance, repair and condition of the Electric System during the ensuing fiscal year and an estimate of the appropriations which should be made for such purposes,*

*(ii) the insurance to be carried under the provisions of Article VII of this Resolution,*

*(iii) the amount that should be deposited during the ensuing fiscal year to the credit of the Improvement and Extension Fund for the purposes set forth in Section 510 of this Article,*

*(iv) the extensions, improvements, renewals and replacements which should be made during the ensuing fiscal year, and*

*(v) any necessary or advisable revisions of the electric rates.”*

This is the twelfth annual Engineering Consultant's Report prepared for the City by Burns & McDonnell.

### 1.2 Electric System Overview and Assessment

The Electric Division served a monthly average of 24,165 accounts in fiscal year (FY) 2014, approximately 19,000 of which were residential customers. Five of the Electric Division customers take service from the 69-kV transmission system. These customers include the Dover Air Force Base, Kraft, Proctor & Gamble, White Oak Solar and NRG Energy Center (NRG). NRG is an exempt wholesale

generator that sells power that must be transmitted through the City's transmission system to third party purchasers. When the NRG plant is not operational, the Electric Division provides power for the plant site.

### **1.2.1 General Plant**

General plant facilities consist primarily of Electric Division administrative and operations facilities and pollution control related equipment on McKee Run Generating Station (McKee Run) and VanSant Generating Station (VanSant). Other types of general plant include office furniture and equipment, transportation and power-operated equipment, and communication equipment.

Effective July 1, 2011, the City entered into an Energy Management Agreement with The Energy Authority, Inc. (TEA) to assist the City with its energy procurement, energy sale, purchase of fuels, establishment and management of risk policies, and the development and management of hedging protocols and related energy procurement challenges. Headquartered in Jacksonville, Florida, TEA is a non-profit energy manager owned by seven public utility systems operating across the nation.

### **1.2.2 Production Plant**

The City owns two generating plants, the McKee Run and VanSant generating stations. McKee Run consists of three steam turbine generating units with a total combined capacity of 136 megawatts (MW). VanSant is a 39 MW simple-cycle combustion turbine unit. NAES Corporation operates the generating plants. The agreement between the City and NAES Corporation has been in effect since July 1, 2006. The various systems and components of the generating plants reviewed by the Engineering Consultant are listed below:

#### Major Equipment

- Steam turbines/generators
- Boilers and auxiliaries
- Station cooling water systems
- Fuel handling systems
- Water treatment systems
- Station electrical systems
- Station control systems
- General facilities

## Management and Organization

- Safety
- Training
- Staffing

Based on statements and information provided by the City, as well as the observations and reviews performed, it is the Engineering Consultant's opinion that the City's power generation facilities are being operated and maintained consistent with generally accepted electric utility practice in the United States. In general, the performance, operation, maintenance, staff, planning, and training aspects for the McKee Run and VanSant were found to be above average. Specifically, the generation facilities have demonstrated a high level of availability despite the dispatching of the units primarily for peak demand.

### 1.2.3 Transmission & Distribution Plant

The transmission and distribution network includes 44 miles of overhead transmission lines, 0.12 miles of underground transmission lines, 190 miles of overhead distribution lines and 271 miles of underground distribution lines. Five Electric Division customers take service off of the 69-kV transmission system. The following list includes areas of the transmission and distribution system that were considered and reviewed.

- System reliability
- Power quality
- Operations and maintenance
- Design standards and specifications
- Transmission and distribution improvements

It is the Engineering Consultant's opinion that the design, construction, operation, and maintenance of the City's electric transmission and distribution system and the associated facilities are consistent with current generally accepted electric utility standards. In recent years, the City has made appropriate upgrades and improvements which the Engineering Consultant has observed while conducting the reviews and assessments to complete the annual reports.

## 1.3 Financial Overview and Assessment

The level of revenues required from the retail electric rates for the Electric Division were determined through the analysis of the financial results and net income or net margins for FY 2014. The Resolution requires that the Electric Division maintain a debt service coverage ratio of 1.25.

Customers of the Electric Division of the City were charged for the electric service they received based on the City's rate schedules and contracts that were in place in FY 2014. A comprehensive cost-of-service and rate design study was completed in 2006 and subsequent rate analyses were completed in 2007, 2008, 2012, and 2013 to examine revenue requirements and revenue generation. Specifically, the 2006 rate study was conducted to address increased costs associated with a new power supply contract that became effective on July 1, 2006. The rate study recommended combining a number of rate classes and implementing rate increases on July 1, 2006. The 2006 rate study also recommended an additional increase be implemented on January 1, 2007 to cover increased costs associated with operating the generating station. The 2007 and 2008 rate analyses re-examined Electric Division revenues and expenses and recognized additional revisions to power supply costs. As a result of these analyses, additional rate increases were implemented on July 1, 2007, July 1, 2008, and July 2012. The July 2013 rate adjustments established the rate schedules utilized by the Electric Division today.

Total energy sales increased from 710.3 GWh in FY 2012 to 723.1 GWh in FY 2013, an increase of 1.8 percent. Total revenue from sales to electric customers in FY 2013 was \$88.3 million, representing a decrease of \$3.6 million from FY 2012 rate revenue of \$91.9 million. In FY 2013, the average revenue per kWh for residential customers was 14.00 cents and the system-wide average price was 12.22 cents per kWh.

The Electric Division's largest cost in providing electric service to its customers is the wholesale cost of power purchased from the Pennsylvania New Jersey Maryland Interconnection (PJM) marketplace through its energy manager, TEA. From FY 2012 to FY 2013, the cost of power increased from \$58.9 million to \$65.4 million. Net income decreased from \$8.5 million in FY 2012 to \$6.2 million in FY 2013. The net income decrease in FY 2013 was due in large part to the increase in transfers out of the Electric Revenue Fund.

Following is an excerpt from Section 502(c) of the Resolution.

*“(c) The total amount of the Revenues of the Electric System during the preceding fiscal year shall have been not less than the total of the following:*

*The Current Expenses of the Electric System during the current fiscal years shown by the Annual Budget . . . for such fiscal year, and*

*One hundred twenty-five percent (125%) of the maximum amount of the Principal and Interest Requirements for any fiscal year thereafter on account of all bonds then Outstanding under the provisions of this Resolution.”*

The Resolution requires that annual revenues of the Electric Division be no less than the total current expenses plus 125 percent of the greatest remaining annual debt service. The Electric Division achieved debt service coverage ratios for FY 2012, FY 2013, and FY 2014 of 6.64, 6.73, and 3.30, respectively. Therefore, the revenues generated by the current electric rates have been sufficient to meet the applicable covenant of the Resolution.

The City maintains a comprehensive insurance program to cover varying types of liabilities, as well as significant losses related to various Electric Division properties. It is the opinion of Burns & McDonnell as Engineering Consultant, and not as insurance counselor, the insurance in full force and affect appears to satisfy the requirements of Section 706 of the Resolution.

The City established the Electric Revenue Fund and the Electric Improvement & Extension (I&E) Fund to make moneys available for specific purposes when they are needed. The following is a list of these funds' respective cash accounts:

#### Electric Revenue Fund

- Insurance Reserve Account
- Contingency Reserve Account
- Electric Rate Stabilization Reserve Account
- Interest and Sinking Account

#### Electric Improvement and Extension Fund

- Depreciation Reserve Account
- Future Capacity Reserve Account

The Engineering Consultant reviewed activity information on the accounts listed above and found that the balances in those accounts as of June 30, 2014, were consistent with the required or target balances.

## **1.4 Conclusions**

Based on the reviews and assessments completed, it is the opinion of Burns & McDonnell that:



1. The City's power generation facilities are being operated and maintained consistent with generally accepted electric utility practice in the United States.
2. The design, construction, operation, and maintenance of the City's electric transmission and distribution system and the associated facilities are consistent with current generally accepted electric utility standards and over the past few years, the system has been upgraded in order to improve operation and service to customers.
3. The Electric Division capital projects included in the City's Capital Investment Plan and the FY 2015 Operating Budget are necessary and should provide improved reliability and power quality for the Electric System.
4. The cash balances as of June 30, 2014 for the various accounts maintained by the City for the Electric Division appear to be sufficient for their defined purposes.
5. The insurance coverage in full force and effect as maintained by the City related to the various assets of the Electric Division appears to satisfy the requirements of Section 706 of the Resolution.
6. The electric revenues generated by the City's current retail rates are more than sufficient to fulfill the debt service coverage requirement (125 percent of current expenses) defined in Section 502(c) of the Resolution.

## **2.0 – INTRODUCTION**

## 2.0 INTRODUCTION

The City of Dover, Delaware (City) operates a municipally-owned electric utility system that served 23,354 customers, excluding lighting, within the City and surrounding areas at the end of fiscal year (FY) 2014. The 68 square-mile service area of the electric utility is located in central Delaware; with the City itself located approximately 70 miles south of Philadelphia, Pennsylvania.

### 2.1 Purpose of Report

This FY 2014 Annual Engineering Consultant's Report (Report) has been prepared in compliance with the requirements adopted December 23, 1985 of the City of Dover Electric Bond Resolution (Resolution). Burns & McDonnell was retained by the City as the Engineering Consultant defined in Section 705 of the Resolution, as follows.

*“The City covenants that it will, for the purpose of performing and carrying out the duties imposed on the Engineering Consultants under the provisions of this Resolution, employ an independent engineer or engineering firm or corporation having a nationwide and favorable repute for skill and experience in such work.”*

The required scope of the Report is described in Section 504 of the Resolution, as follows.

*“The City covenants that it will cause the Engineering Consultants employed under the provisions of Section 705 of this Resolution . . . to make an inspection of the Electric System at least once each fiscal year and . . . to submit to the City Manager a report setting forth (a) their findings whether the properties of the Electric System have been maintained in good repair, working order and condition and whether they have been operated efficiently and economically and (b) their recommendation as to*

*(vi) the proper maintenance, repair and condition of the Electric System during the ensuing fiscal year and a estimate of the appropriations which should be made for such purposes,*

*(vii) the insurance to be carried under the provisions of Article VII of this Resolution,*

*(viii) the amount that should be deposited during the ensuing fiscal year to the credit of the Improvement and Extension Fund for the purposes set forth in Section 510 of this Article,*

*(ix) the extensions, improvements, renewals and replacements which should be made during the ensuing fiscal year, and*

*(x) any necessary or advisable revisions of the electric rates.”*

## **2.2 Organization**

The Electric Utility Director is responsible for the overall management of the Electric Utility Division. Mr. Harry Maloney is the current Electric Utility Director for the Electric Division. The Electric Director oversees the day-to-day operations of the Electric Division and manages the Division's staff. The Director also provides oversight of the production plant budget, monitors the contracts of the energy coordinator and the power generation operator/manager, and is responsible for North American Energy Services Corporation (NAES Corporation) contracts and oversight. The Electric Division is organized into four separate operating sections. Descriptions of the current Electric Division sections are provided below.

Administration Section – Administration provides the overall management of the Electric Division's Engineering and Transmission & Distribution Sections. This section performs all planning and budgeting, monitors all construction projects, administers all power supply and generating station operations agreements, and coordinates with customer service and public relations for the Electric Division.

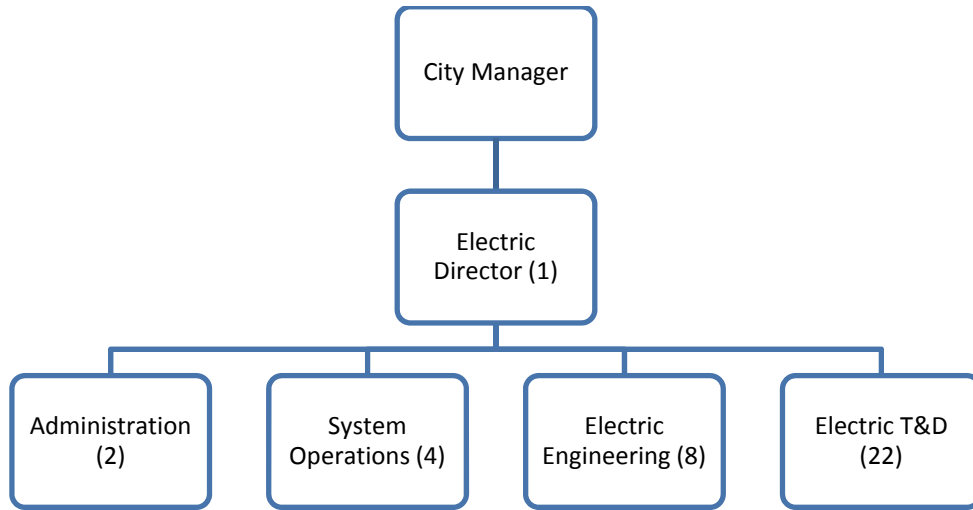
Electric Engineering Section – Electric Engineering provides design, specifications, construction management, and project inspection for all capital investment projects of the Electric Division. This section also develops and maintains maps, plans, and specifications, as well as engineering standards for construction and maintenance of the Electric System.

The group formerly known as the System Operations Section has been reorganized as part of the Electric Engineering Section. This group is responsible for the operation of a 24/7 system operations control center and is comprised of the System Operators Crew Leader and the Operators.

Transmission & Distribution Section – Transmission & Distribution constructs, operates, and maintains the overhead and underground electric systems and fiber optic communication facilities. This section installs and maintains all electric metering, as well as street and security lighting. This section also investigates and resolves customers' power supply problems and oversees the work of tree trimming contractors.

Figures 2-1 through 2-3 provide organizational charts illustrating the staffing hierarchies of the various sections in the Electric Division. The number of individuals in each position was indicated as appropriate. Electric Division staff totaled 37 at the time this report was issued.

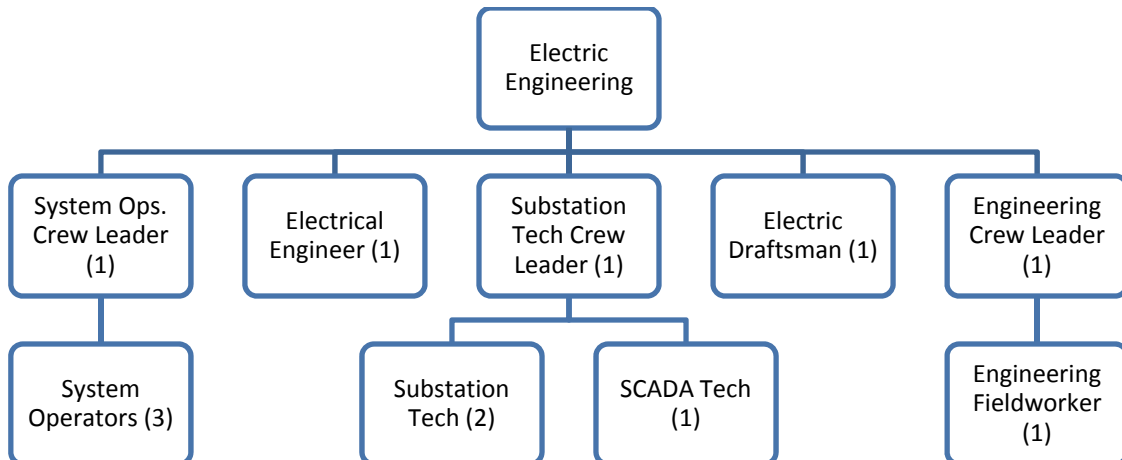
**Figure 2-1: Organization**



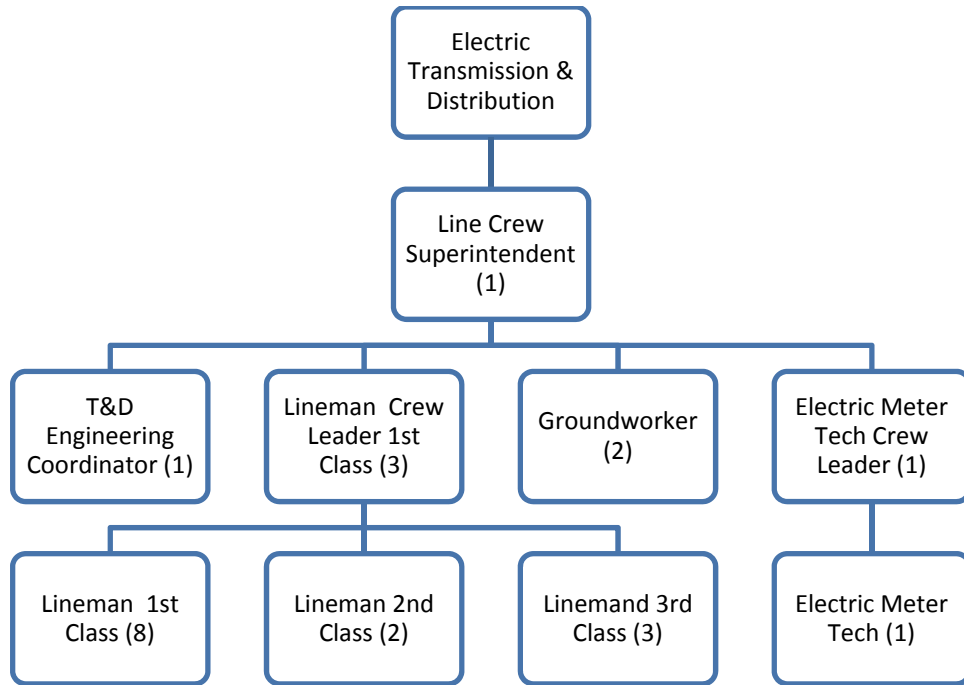
**Figure 2-2: Administration Section**



**Figure 2-3: Electric Engineering Section**



**Figure 2-4: Electric Transmission & Distribution Section**



The subsequent sections of the Report provide a discussion of the required reviews and inspections conducted pursuant to Section 504 of the Resolution. Section 3.0 describes the assessment of the Electric System and its condition. Section 4.0 presents the financial results for the Electric Division, including an analysis of the adequacy of revenues provided by the electric rates. Section 5.0 summarizes the conclusions of Burns & McDonnell regarding the operation and maintenance of the Dover Electric System.

### **3.0 – ELECTRIC SYSTEM OVERVIEW AND ASSESSMENT**

### 3.0 ELECTRIC SYSTEM OVERVIEW AND ASSESSMENT

#### 3.1 Electric System Overview

The Electric System owned by the City primarily consists of a production plant, transmission plant, distribution plant, general plant facilities, and construction work in progress. Table 3-1 displays the year-end balances of the various plant components for FY 2012 through FY 2014. Table 3-2 itemizes the specific capital investment plan projects and anticipated expenditures included in the FY 2015 budget.

**Table 3-1: Year-End Plant in Service**

	FY 2012	FY 2013	FY 2014
Capital assets, not being depreciated			
Land	\$ 1,458,066	\$ 1,458,066	\$ 1,458,066
Construction in progress	789,014	1,338,909	1,690,462
Total capital assets, non-depreciable	<u>\$ 2,247,080</u>	<u>\$ 2,796,975</u>	<u>\$ 3,148,528</u>
Capital assets, being depreciated			
Buildings	\$ 17,456,628	\$ 17,619,349	\$ 17,666,269
Production	64,610,399	65,040,049	65,913,284
Transmission	33,106,748	34,010,686	35,084,087
Distribution	60,680,365	61,752,469	62,388,947
Administration	1,634,017	1,743,754	1,743,754
Vehicles	640,096	625,876	645,747
Total capital assets, being depreciated	<u>\$ 178,128,253</u>	<u>\$ 180,792,183</u>	<u>\$ 183,442,088</u>
Less accumulated depreciation for:			
Buildings	\$ (11,400,308)	\$ (11,795,879)	\$ (12,172,080)
Production	(41,416,622)	(42,682,428)	(44,002,794)
Transmission	(10,344,554)	(11,537,017)	(12,776,190)
Distribution	(25,322,267)	(26,832,246)	(28,382,673)
Administration	(1,196,545)	(1,316,532)	(1,427,205)
Vehicles	(464,219)	(481,527)	(517,428)
Total accumulated depreciation	<u>\$ (90,144,515)</u>	<u>\$ (94,645,629)</u>	<u>\$ (99,278,370)</u>
Total capital assets, being depreciated, net	<u>87,983,738</u>	<u>86,146,554</u>	<u>84,163,718</u>
Total capital assets, net	<u>\$ 90,230,818</u>	<u>\$ 88,943,529</u>	<u>\$ 87,312,246</u>

In FY 2014, the Electric System experienced a decrease in the annual system peak demand and a decrease in annual energy sales from the previous year. The Electric System experienced its peak at 4 p.m. on July 18, 2013 of 164.2 MW; a decrease of 7.4 MW from the previous year. For the year, 720.9 GWh of energy were sold; a decrease of 0.7 percent from the preceding year. The Electric Division projects energy sales in FY 2015 to total 712.2 GWh, a decrease of 1.2 percent. The Electric Division expects annual energy sales to grow moderately from FY 2016 through FY 2020.



**Table 3-2: Fiscal Year 2015 On-going/Planned Capital Expenditures**

<b>Production</b>	
McKee Run & VanSant Preservation of Structures	\$ 135,800
McKee Run High Energy Piping	26,500
Unit 3 Boiler Systems	138,000
Unit 3 Auxillary System Components	89,000
Unit 3 Turbine Outage - Inspections & Repairs	151,800
Unit 3 Cooling Tower Life Extension	1,091,200
VanSant Capacity Increase	901,900
Metering System Upgrades	90,000
Safety & Compliance Improvements	115,100
Subtotal Electric Generation Division	<u>\$ 2,739,300</u>
<b>Transmission &amp; Distribution</b>	
New Developments - UG Transformers	\$ 87,400
New Developments - UG Conductors/Devices	105,100
West Dover Connector	250,000
Meadows at Jefferson Terrace	15,400
Chestnut Grove Development	299,000
Garrison Oak Technical Park	184,000
Uzin Utz Manufacturing	8,000
Playtex/Energizer System Upgrades	200,000
Clearview Meadows	81,200
Dover Downs Tower	51,600
Leander Lakes	73,000
Eden Hill Lights	17,000
Family Dollar Store	7,500
Meter Replacements & System upgrades	150,000
Vehicles, Trucks, & Equipment	275,000
Subtotal Electric Transmission Division	<u>\$ 1,804,200</u>
<b>Electric Engineering</b>	
Substation Battery Replacement	\$ 24,500
Capitol Park - Underground	27,500
Richardson Circle	400
Chandelle Airport URD	52,900
Townpoint Distribution Upgrades	250,000
Lighting Project and Rehabilitation	50,000
Horsepond Road Substation Reliability Upgrade	468,700
McKee Run & State College Road Feeder replacements	50,000
GOTP Transmission Line Relocation	550,000
Horsepond SS to Cartanza 69kv Rebuild	75,000
69kv Substation Cable Replacement North Street	85,000
General Scott Switchgear	1,137,600
Vehicles, Trucks, & Equipment	28,600
Subtotal Electric Engineering Division	<u>\$ 2,800,200</u>
<b>Total Planned Capital Investment Projects</b>	<b>\$ 7,343,700</b>

### **3.1.1 Production Plant**

The City owns two plants, the McKee Run and VanSant generating stations. McKee Run consists of three steam turbine generating units with a total combined capacity of 136 megawatts (MW). VanSant is a 39-MW simple-cycle combustion turbine unit.

NAES Corporation operates the generating plants. The agreement between the City and NAES Corporation has been in effect since July 1, 2006. The Engineering Consultant's observations regarding the generating stations and units are described later in this section of the Report.

Effective July 1, 2011, the City entered into an Energy Management Agreement with The Energy Authority, Inc. (TEA) to manage the sales associated with the production plants; the Electric Division's first contract with TEA. TEA also assists the City with its energy procurement, energy sales, purchase of fuels, establishment and management of risk policies, the development and management of hedging protocols and related energy procurement challenges.

### **3.1.2 Transmission & Distribution Plant**

The service area includes 44 miles of overhead transmission lines, 0.12 miles of underground transmission lines, 190 miles of overhead distribution lines and 271 miles of underground distribution lines. Five Electric Division customers take service off of the 69-kV transmission system. These customers include the Dover Air Force Base, Kraft, Proctor & Gamble, and NRG Energy Center (NRG). NRG is an exempt wholesale generator that sells power that must be transmitted through the City's transmission system to third party purchasers. When the NRG plant is not operating the Electric Division provides power for the plant site.

The Electric Division has two contracts for providing transmission service through the Electric System. The Electric Division provides transmission service to NRG for the output of its 16 MW electric generator. The Electric Division also has a point-to-point contract for the output of an NRG Combustion Turbine which ties directly to the Kent Substation and is not part of the Dover transmission system.

### **3.1.3 General Plant**

The general plant category consists primarily of Electric Division administrative and operations facilities, and pollution control-related equipment at McKee Run and VanSant. The agreement with NAES Corporation stipulates NAES Corporation manage the operation and maintenance of the facilities while the City funds all replacements and upgrades required for maintaining the capability of the two generating stations. The City is also responsible for the costs of compliance with new regulations promulgated. Other types of items included in the general plant category include office furniture and equipment, computer-

related equipment, transportation and power-operated equipment, and communication equipment. Burns & McDonnell did not specifically assess the items in the general plant category for this Report.

### **3.2 Production Plant Assessment**

Burns & McDonnell made observations and conducted assessments of the Electric System assets in support of the development of this annual Engineering Consultant's Report. On June 4, 2015, Mr. Ted Kelly of Burns & McDonnell met with representatives of NAES Corporation to discuss the condition of the McKee Run and VanSant generating stations. Mr. Kenneth Beard, the Plant O&M Manager, coordinated the visit along with Mr. Don Mordus, the Plant Manager. Mr. Harry Maloney, the Electric Utility Director, attended the meeting as well. The findings of Burns & McDonnell from the assessment of the City's production plant assets are documented herein.

#### **3.2.1 Production Plant Operations**

McKee Run consists of three units. Units 1 and 2 were originally coal-fired units, which began operations in 1961 and 1962, respectively. In 1972, these units were converted to burn No. 6 fuel oil. Units 1 and 2 each have rated capacities of 17 MW. Unit 3 began operations in 1975 and was designed to fire No. 6 fuel oil and natural gas. Unit 3 has a rated capacity of 102 MW. In FY 2008, the City began work to convert all three units at McKee Run to burn No. 2 fuel oil in order to reduce pollution from the plant. To date, the necessary upgrades and new equipment had been installed allowing each of the units to burn both natural gas and No. 2 fuel oil.

VanSant consists of a simple cycle combustion turbine with a rated capacity of 39 MW. This unit commenced operation in 1991. VanSant remains unmanned, except when it is dispatched into service. On the occasions when the unit is dispatched, personnel from McKee Run are transferred to VanSant to startup and operate the unit.

##### **3.2.1.1 Management and Organization**

Station management is well organized and knowledgeable. Personnel take a logical approach to the operation and maintenance of the generation facilities. Mr. Don Mordus serves as the Plant Manager. The management/leadership team consists of eight positions including Mr. Mordus' position. The Administrative Manager, O&M Manager, Compliance Coordinator, and Materials Coordinator, all report directly to Mr. Mordus. (Note: there will be retirements in the leadership team in the next couple of years.) One Operations Supervisor position and one Day Shift Operator position are currently open at the plant. The open Operations Supervisor position is part of the management/leadership team. (Note: Three new operators have been hired in calendar year 2015.)

The O&M Manager oversees a Maintenance Supervisor and four Operations Supervisors. When fully staffed, each operations team consists of a supervisor and three operators working 12-hour rotating shifts. Two operators work eight-hour flex time shifts Monday through Friday, and fill in as needed. The maintenance team consists of a supervisor and five employees working eight-hour shifts. The operations and maintenance personnel are all union employees. The relationship between the union and management was reported to be excellent. McKee Run is currently at a staff level of 29 employees, with 32 approved positions.

### 3.2.1.2 Major Equipment Operations and Maintenance

In general, the generation facilities appear to have been properly operated and maintained, and in good condition as evidenced by the high availability of the units. The generation facilities are dispatched sparingly and operate primarily as peaking units. As such, the individual units incur a low annual capacity factor. Table 3-3 summarizes the major FY 2014 operating statistics.

**Table 3-3: FY 2014 Generating Plant Operating Statistics**

Unit	Rated Capacity - MW	Net Production - kWh	Net Capacity Factor	Net Heat Rate Btu/kWh	Number of Starts
VanSant McKee Run	39	2,836,509	0.83%	13,582	21
Unit 1	17	895,980	0.60%	16,063	7
Unit 2	17	1,442,809	0.97%	14,593	8
Unit 3	102	23,304,093	2.61%	11,841	32
Total	175	28,479,391	1.86%		68
Unit	Forced Outage Hours	Operating Hours	Service Factor	Equivalent Availability Factor	
VanSant McKee Run	-	84.2	0.96%	60.29%	
Unit 1	80.0	135.7	1.55%	59.36%	
Unit 2	-	228.1	2.60%	60.29%	
Unit 3	2.0	423.7	4.84%	60.26%	
Total	82.0	871.7	9.95%	60.04%	

The large amount of time that units are not operating allows for maintenance and repair of the units. As a result, the FY 2014 overall equivalent availability factor for the generation facilities averaged 60.04 percent. Low net capacity factors are offset by PJM capacity credits. In FY 2014, \$15.1 million of PJM capacity credits helped cover the entirety of purchased capacity costs. PJM capacity credits are expected to continue to offset significant portions of system capacity costs in FY 2015 and beyond.

### **3.2.1.3 O&M Management System**

Maintenance activities are organized, planned, and managed using MP2<sup>™</sup> by CMMS Data Group, a computer-based management system. All three major categories of maintenance activities (corrective, preventative, and predictive) are electronically managed by MP2<sup>™</sup>.

For corrective maintenance activities, any station operator or mechanic can enter a work order into the system at any terminal on the Station local area network (LAN). A supervisor reviews the request, turns it into a work order, and assigns a priority according to a predetermined categorization. The work order is planned, parts are ordered, and then the work order is assigned to an operator or maintenance technician for completion once the material has been received.

This system is also used to manage and track preventative maintenance activities that follow a schedule. Changing filters, and turning on and off heat tracing are examples of preventative maintenance. Predictive maintenance activities practiced include oil analyses, vibration testing, and infrared surveys. Portable vibration testing equipment is used at the Stations to improve the frequency of and capabilities to troubleshoot rotating equipment. The technology allows personnel to identify problems and take corrective actions before equipment failure occurs.

### **3.2.1.4 Safety**

“Safety First” is an overall theme and attitude of the Electric Division. Near-miss incidents are documented, reviewed, and corrective follow-up actions are taken as required with an employee-run safety committee actively in place. This committee conducts monthly safety meetings, completes safety equipment inspections, and defines and implements tasks to improve safety in all areas. Members of the safety committee complete periodic visual inspections of employee work activities utilizing an observation checklist to detail their findings. Recorded observations are discussed and infractions corrected. Safety is the first topic discussed at all meetings at the generating plant. An indoctrination video emphasizing safety is shown to all visitors when entering the Station.

Mr. Mike Benkert, Senior Project Manager – Safety, reported there were no restricted work days or lost time accidents reported in FY 2014. NAES ended the year with 54,420 man-hours worked with no OSHA recordable accidents.

### **3.2.1.5 Training**

The required annual OSHA compliance training is completed and documented for each employee. A formal two-day employee orientation program is required for all new employees. This orientation covers a multitude of subjects from employee benefits to a review of the various Station operating manuals.

For operator training, the Employee Development and Qualification Program (EDQP) was established prior to 2002. EDQP is a formal program for training operators to progressively advance to positions with additional responsibilities. The training program is a combination of a self-paced and instructor-led learning. In addition to the above programs, cross training of various disciplines also occurs. An example of cross training would be plant operators training with maintenance staff. NAES has made some modifications to the program to make it more applicable to the specific utility.

Plant staff receive environmental and safety training online via the GPi Learning website. The training includes tutorials and exams to ensure comprehension of the subject matter. Plant manuals, meetings, etc. offer additional safety training.

Plant staff continues to receive appropriate operator certification training for the Pennsylvania New Jersey Maryland Interconnection (PJM) market. This training should continue in the future. The plant also completes planning and scheduling training on a regular basis for plant operators.

### **3.2.1.6 Capital Improvements**

The following describes completed, on-going, and planned improvements to the City's generation assets:

Recently Completed (FY 2012- FY 2014):

- Industrial Wastewater Discharge System
- McKee Run Demineralizer Replacement
- McKee Run Natural Gas System Block/Bleed Valves
- Unit 3 Fire Protection System
- Unit 3 - Stack Repairs
- Unit 3 Boiler Air Heater
- Unit 3 - Gas Modification
- Unit 3 FD & ID Fan Controller Upgrade
- Unit 3 DCS Computers & Software Upgrades
- Unit 3 Air Heater Expansion Joint
- McKee Industrial WW Discharge system
- Unit 3 Generator Repairs
- Units 1 & 2 Life Extension
- Units 1 & 2 Cooling Tower Life Extension
- Units 1 & 2 Control Modifications
- Units 1 & 2 Stack Repairs

- Units 1 & 2 Component Repairs
- Unit 1 Gasket Leak Repair
- Unit 2 - Boiler Inspection & Repair

On-Going:

- McKee Run & VanSant Preservation of Structures
- McKee Run High Energy Piping
- Unit 3 Boiler Systems
- Unit 3 Auxiliary System Components
- Unit 3 Turbine Outage - Inspections & Repairs
- Unit 3 Cooling Tower Life Extension
- VanSant Capacity Increase
- Metering System Upgrades
- Safety & Compliance Improvements

Planned (through FY 2020):

- McKee Run Building Equipment Replacements
- Unit 3 Software & Computer Upgrades - CEMS
- Unit 3 - Stack Repairs
- Unit 3 Cooling Water Line Replacement/Repairs
- Unit 3 Hydrogen Purity Analyzers
- VanSant Software & Computer Upgrades - CEMS
- VanSant Major Overhaul & Inspection
- VanSant Component replacements

### **3.2.2 McKee Run Condition Assessment**

The following is a summary of the condition assessment of major equipment at McKee Run as presented by the NAES corporation staff. Units 1 and 2 will be decommissioned in 2017; therefore, major maintenance and capital projects have been and will be limited for these units in the near future. Burns & McDonnell made no internal assessments of equipment during the facility tour.

XL Insurance completes inspections of the Electric Division production facilities on an annual basis. After each inspection the insurance provider issues a report detailing its risk reduction recommendations. No new recommendations were made this year.

### **3.2.2.1 Steam Turbines/Generators**

The steam turbines and generators for VanSant and McKee Run Units 1 and 2 were reported to be in satisfactory condition with no major problems.

In FY 2012, Unit 1 conducted turbine generator checks and found a bearing steam seal leak. Steam seals were removed and sent out for refurbishment by Siemens Energy Services during the fall 2012 outage. Bearing was inspected and checked for wear. Bearing did have some wear and did not meet acceptable tolerance, so it was sent out for refurbishment by Fusion Babbiting. Turbine condition assessment was conducted during the fall outage and the Units were found to be in satisfactory working condition.

During the spring 2013 outage, an extensive inspection and testing was performed on Unit 3's turbine and generator. The inspection showed signs of seal oil, hydrogen, and busing box leakages. All issues were fixed and brought to acceptable operating standards. During the fall 2013 outage, NAES mechanics installed new hand wheel throttle valve mechanical parts. Thereafter, the IC&E installed a portable vacuum pump to the Unit 1 turbine to simulate vacuum. The turbine was reset and the throttle valve was closed. The throttle valve was then fully opened with no issues and the handle was freewheeling.

No inspections, planned maintenance or upgrades were completed on Units 1 and 2 during the 2014 outages. During the spring 2014 outage, Unit 3 was dismantled and inspected. Erosion was detected in some places and steps were taken to mitigate. The unit experienced vibration issues during the startup process, but no cause was found after multiple tests. Vibration issues were no longer experienced during the fall outage.

### **3.2.2.2 Boilers and Auxiliaries**

Boiler inspections are conducted every year on each of the boilers. The annual inspections typically include the inspection and cleaning of the major boiler components, including the mud and steam drums, the forced draft and induced draft fans, the windbox, condenser water box, condenser tubes, hotwell, air preheater components, and safety valves.

Following its FY 2010 annual inspection of the production facilities, XL Insurance recommended the City implement a program that tracks annual hot and cold settings of hangers in the steam, reheat, feedwater and boiler systems. In FY 2011 and FY 2012, the City met the recommendation by implementing a program that will examine the high energy piping systems on a five-year basis, beginning in 2014.

In FY 2012, several principle changes were made on the generating system's boiler and auxiliary units at McKee Run. New Beck drives were installed on Unit 3 induced draft and forced draft fans. Also, sector



plates and seals were replaced in the Unit 3 air heater. A leak was detected in a Unit 3 boiler water wall tube due to caustic gouging in 2012. Ultrasonic testing of the boiler tubes is planned during the next major outage in 2018.

During FY 2013 inspections, no major issues were found within the Unit 1 or Unit 2 boiler. Unit 3 had an issue during the startup of the boiler while attempting to obtain a boiler purge. The issue was fixed by replacing a Gas Fuel Trip Relay. Waterwall tubing sections were replaced around Unit 3's A-2 burner throat.

During the spring 2014 outage, piping maintenance and replacements earned the most attention at Unit 1 in addition to typical planned inspections and maintenance on all units. Unit 2 repairs were primarily piping focused as well. Ash and debris was cleared from Unit 3 and a leak was found and repaired.

No adverse conditions, controls, or operational concerns were reported during the 2014 fall outage at Units 1 and 2. During that outage the neutralization pit liner was replaced, new insulation and lagging was installed on the high energy piping, and leaking tubes were replaced all on Unit 3.

### **3.2.2.3 Station Cooling Water Systems**

The Station has split cooling water systems with one system serving Unit 1 and Unit 2 and a separate system serving Unit 3. Projectile tube cleaning was completed on the Unit 1 and Unit 2 condensers during the spring FY 2011 outage. All the tubes in each unit were cleaned utilizing the scraper blade plug method. Samples were taken from the tube cleanings and retained for inspection. No leaks were detected in the expansion joint or condenser tubes. Each condenser box was cleaned. A significant Unit 3 cooling tower project was completed in CY 2014. This project included the change out of a number of columns in the tower, work on the hot deck, and balancing of water flow. The cooling water systems are reported to be sufficiently sized and in satisfactory condition, with no major issues reported at the time of this Report.

### **3.2.2.4 Fuel Handling Systems**

Natural gas is delivered to the Station via a 4-inch pipeline for Unit 1 and Unit 2 and in a 10-inch diameter pipeline for Unit 3. No. 2 fuel oil is delivered to the Station by truck and unloaded into tanks. Forwarding pumps deliver the fuel oil to each of the units. No major fuel projects were reported to be completed in FY 2014.

### **3.2.2.5 Water Treatment/Steam Purity**

Quality control parameters for boiler feed-water, internal boiler water, cooling tower water, and steam purity are checked at a minimum of twice per day when systems are operating. Results are recorded and

graphically compared to control limits. Adjustments are then made as required. Boiler feed water is treated city water (well water from the City) using a regenerative ion resin demineralizer system, along with deaeration for oxygen control. Boilers 1 and 2 use a coordinated phosphate control for boiler internal purity control and Boiler 3 uses a balanced trisodium phosphate and disodium phosphate within a narrow pH range. A deep-bored water well was installed to provide water in addition to the City supplied water. City water has a high chlorine level which may exceed the Station permitted limits. By combining City water with the well water, the chlorine levels can be maintained at the permitted limits. Water for cooling tower makeup is also obtained from City water. The primary control parameter is silica concentration. Blow down is adjusted as required to maintain control. The City received an industrial waste water permit from Kent County to be able to discharge cooling water to the sewer system. No major water treatment issues were reported at the time of this Report.

Steam purity is not continuously monitored. Samples are taken at least twice daily and tested for pH, conductivity, and silica. There have not been any problems with steam purity. Annual inspections of the boiler drums and separation internals have verified that these systems are intact and operating properly.

Following its FY 2010 annual inspection of the production facilities, XL Insurance recommended the City implement lay-up procedures to protect water systems from corrosion. In FY 2011 and FY 2012, NAES worked to update plant procedures to conform to best practices/OSHA standards.

In FY 2014, the station did not experience any internal corrosion related failures, steam path deposits, or excessive condenser fouling. Condor Technologies provides water treatment consulting services and chemicals. A representative visits the Station periodically to review test data and check chemical usage rates. No major issues were reported at the time of this Report.

### **3.2.2.6 Station Electrical Systems**

Overall, Station electrical systems and transformers are considered to be in satisfactory condition. A condition assessment of the generation facilities' transformers was conducted in 2014 by TJ/H2b Analytical Services. Oil inspections and analyses were conducted. The inspector recommended that normal operation continue for all the transformers at the plant; however, heating was indicated at two of the transformers. The City has a contract with an environmental consultant to check each substation for oil leaks and to provide instruction on cleaning up in the event of an oil spill.

Oil sampling is now completed twice per year on the generator step-up transformers (GSUs). Based on the 2012 XL Insurance annual inspection, there are still no sprinkler protection or blast walls for GSU's 1-3. In 2012, the city had blast walls installed between Units 1 and 2 auxiliary transformers as

recommended in the insurance report. This item has since been closed per the insurance company. All plant transformers are examined annually.

### **3.2.2.7 Station Control Systems**

Unit 1 and Unit 2 controls are electro-pneumatic. Unit 3 controls are a distributed control system (DCS).

Following its 2007 annual inspection of the production facilities, XL Insurance recommended the City seal openings in fire barriers through which cables pass. The City has worked each year since to make progress on sealing openings in fire barriers. The City completed sealing the rest of the openings as part of its boiler controls and control room upgrades in 2013.

In general, the station control systems are considered to be in satisfactory condition. The Unit 1 and Unit 2 control systems are outdated but perform satisfactorily. All relays have recently been inspected at both McKee Run and VanSant for North American Electric Reliability Corporation, PJM Interconnection and Mid-Atlantic Area Council compliance. The electro hydraulic control system was modified to become a primary/primary system in 2013. In 2013 additional control wiring was installed to upgrade the Unit 1 and Unit 2 gas control system. No additional controls upgrades or issues to report for FY 2014.

### **3.2.2.8 General Facilities**

No major projects or improvements were completed to the General Facilities in FY 2014 other than routine maintenance and repairs. In general, the station facilities appeared clean and well maintained during the site visit.

### **3.2.3 VanSant Condition Assessment**

The following is a summary of the condition assessment of major equipment at VanSant as presented by the NAES corporation staff. Burns & McDonnell made no internal assessments of equipment during the facility tour.

In general, the unit is operated infrequently, but is well maintained. The VanSant unit has the capability of black starts. The unit is not permitted for remote control. Although the station is only manned when operating, an operator performs a twice daily walk through with a checklist of items to review and the results are logged.

XL Insurance completes inspections of the Electric Division production facilities on an annual basis. After each inspection the insurance provider issues a report detailing its risk reduction recommendations. The lone recommendation for VanSant following the FY 2012 inspection addressed safety. XL Insurance

recommended the installation of gas detection equipment at the plant. A gas detection system has been installed. The gas detectors will activate the fire suppression system and alarm to the central control system. No other major repairs or upgrades were made at VanSant in FY 2013.

A capital project was completed on the exhaust stack and the D1 water tank was cleaned in FY 2014. NAES Instrument, Control and Electrical (IC&E) Technicians completed four recommended General Electric Technical Information Letters (TIL) projects for VanSant Unit 11 in the spring 2014 outage as shown below:

1. Annual TIL 1004-2R1 (IGV's and first stage corrosion/pitting inspection)
2. Annual TIL 1068-2R1 (IGV's bushing inspection)
3. Annual TIL 1132-2 (IGV thrust washer corrosion inspection)

Spring 2014 inspections indicated normal wear on the unit and minor maintenance was completed. During the fall 2014 outage, several minor projects were identified and will be completed at the time of the next major project on the unit. No issues were reported.

Every five years, the fuel tanks are inspected for rust and corrosion for leak prevention. The next scheduled inspection is in FY 2015.

### **3.2.4 Production Plant Conclusion**

Based on statements and information provided, as well as the observations and reviews performed, it is the opinion of Burns & McDonnell that the City's power generation facilities are being operated and maintained consistent with accepted electric utility practice in the United States. In general, the performance, operation, maintenance, staff, planning, and training aspects for the McKee Run and VanSant stations were found to be above average. Specifically, the generation facilities have demonstrated a high level of availability despite the dispatching of the units primarily for peak demand.

### **3.3 Transmission & Distribution Plant Assessment**

On June 4, 2015, Mr. Ted Kelly visited the City to collect information and to observe the City transmission and distribution system, as operated and maintained by the Electric Division. Mr. Harry Maloney provided information related to the transmission and distribution system. Mr. Maloney also led a tour of the electric transmission and distribution system.

### **3.3.1 T&D Plant Operations**

The Electric Division distributes power to its customers by a network of transmission lines, distribution substations, and distribution lines. The transmission lines are rated at 69 kV and are connected to fifteen distribution substations located throughout the service area. The distribution substations reduce the power from transmission voltages to the primary distribution voltages of 12 kV to facilitate distribution of electric power to customers.

#### **3.3.1.1 Operations and Maintenance**

The Electric Division has a SCADA system that is monitored continuously for any problems that may arise in the Electric System. The main control room has two system operator desks and a large screen where system operating information is displayed. System operators can monitor the Electric System operation, such as voltage levels, current flows, etc. and make necessary adjustments as problems arise. The systems operators have received some PJM training, but are not required to be certified as Delmarva Power is the controlling agency.

Loading on substation transformers used for an emergency, a switching operation, or maintenance is limited to 120 percent of the rated capacity, followed by a twelve-hour cool-down period. The Electric Division has eight line crews to work on the system. Four crews are responsible for overhead lines, four crews are responsible for underground lines, and one crew is responsible for maintenance. The primary responsibilities of the eight line crews are installation of new service connections and construction of new lines. The trouble crew maintains the street lights, repairs underground services and is the first responder to outages. Tree trimming is contracted out and is no longer performed by the Electrical Division; however, performance of the contractor is monitored by the Line Crew Superintendent.

The Substation/Relay Maintenance Division is responsible for operation and maintenance of the substations and associated equipment. Visual inspections of substations, associated equipment, trip counter checks and battery systems checks are performed regularly. The Substation/Relay Maintenance Division is also responsible for contractor oversight during annual transformer condition assessments.

TJ/H2b Analytical Services completed the annual transformer condition assessments in February 2011. No abnormal gas was indicated and since the oil condition was within acceptable parameters, TJ/H2b recommended the continuation of normal operation. The City has a contract with an environmental consultant to check each substation for oil leaks and to provide instruction on cleaning up in the event of an oil spill.

The City contracts with an outside firm to inspect and chemically treat each wood pole in the Electric System every ten years. This is accomplished by awarding a five-year contract to spread out the expenses. Pole treatments were completed in May of 2013. Dover treated and inspected over 760 poles during 2013, of which, only one pole was rejected resulting in a 99.9 percent pass rate.

### **3.3.1.2 Design Standards and Specifications**

The Electric Division designs the transmission and distribution circuits and some substation upgrades in conformance with national safety standards. Other substation and transmission design is contracted to Pike Electric, Inc.

The underground distribution design utilizes road or alley front access construction. This design means the electrical equipment, such as transformers and underground cable, are installed beside the road instead of behind houses or buildings. The advantage of front access construction is the accessibility for maintenance and repairs to cable and electric equipment. The underground cables are installed in polymerized vinyl chloride pipe for added protection and for easy cable replacement. The Electric Division installs jacketed, concentric cable that is rated at 15 kV, with 133 percent ethylene propylene rubber insulation.

The standard overhead distribution design utilizes a flat construction with a single cross-arm and insulators on 45-foot class 2 poles. Typically all electrical equipment locations have ground rods installed with measured readings of 25 ohms or less.

The substation design is generally a low-profile rigid bus design. The circuit breakers are SF6 gas-filled and the relays are microprocessor based with SCADA control and monitoring.

### **3.3.1.3 System Reliability**

The Electric Division provides for reliability of its distribution system by configuring a majority of its distribution circuits in primary open loop arrangements, improving existing circuits, and installing adequate substation transformer capacity. Normal transformer and line loading are limited to provide sufficient margin to convey firm power requirements during an emergency or a switching operation, or for maintenance.

### **3.3.1.4 Power Quality**

The Electric Division does not have any significant power quality problems. The overall power factor for the Electric System is 99.9 percent. Power transformers are equipped with load tap changers that regulate bus voltages at the distribution substations. Distribution transformers are equipped with no-load taps to

make voltage adjustments. There are capacitors and voltage regulators on the Electric System that control voltage and vars on the portion of the system furthest away from the current source and generation. The system operators monitor the power factor closely and turn on capacitors or adjust the generation to compensate for low power factors.

### **3.3.1.5 Safety**

Mr. Maloney reported to Burns & McDonnell the Electric Division had 94.5 hours of lost time in FY 2014 comprised of four incidents. Details of the incidents were not provided for this report.

### **3.3.1.6 Capital Improvements**

The following describes completed, on-going, and planned improvements to the City's transmission and distribution assets:

Recently Completed (FY 2012-FY 2014):

- Wyoming Avenue - Underground
- Pleasonton Acres - Underground
- Morris Estates - Underground
- Royal Grant - New Underground Service
- Dover Downs Switchgear
- Lebanon 400 Feeder
- Bayside Drive (Persimmon to White Oak Rd)
- Distribution System Upgrades - Unidentified
- Substation Equipment & Fencing (Division St)
- SCADA Master Hardware Replacement
- Transmission Line Maintenance Program
- Distribution Feeder Replacement Program
- Distribution Capacitors - Overhead
- 69-kV Switch Replacement
- McKee Run Transformer/Substation Repairs
- Frazier Substation Reliability Upgrade (900 circuits)
- Substation PT & CT Replacement Program

On-Going:

- Substation Battery Replacement

- Capitol Park - Underground
- Richardson Circle
- Chandelle Airport URD
- Townpoint Distribution Upgrades
- Lighting Project and Rehabilitation
- Horsepond Road Substation Reliability Upgrade
- McKee Run & State College Road Feeder replacements
- GOTP Transmission Line Relocation
- Horsepond SS to Cartanza 69-kV Rebuild
- 69kv Substation Cable Replacement North Street
- General Scott Switchgear
- New Developments - UG Transformers
- New Developments - UG Conductors/Devices
- West Dover Connector
- Meadows at Jefferson Terrace
- Chestnut Grove Development
- Garrison Oak Technical Park
- Uzin Utz Manufacturing
- Playtex/Energizer System Upgrades
- Clearview Meadows
- Dover Downs Tower
- Leander Lakes
- Eden Hill Lights
- Family Dollar Store
- Meter Replacements & System upgrades

Planned (through FY 2020):

- Distribution System Upgrades - Unidentified
- Oak Grove Trailer Park Distribution Upgrade
- Lakeland Laurel Point - Distribution Upgrade
- Rt 8/ Mifflin Road Crossing - Distribution Upgrade
- Route 8/Taps - Distribution Upgrade
- Townsend Brothers - Distribution Upgrade



- Persimmon Tree Apartments - Distribution Upgrade
- North Street OH to UG (Governors to Queen)
- Dover East Estates - Distribution Upgrade
- Satellite Synchronized Substation Clocks
- Horsepond Road URD - Distribution Feeders
- Transmission Line Maintenance Program
- Distribution Capacitors - Overhead
- Distribution Capacitors - Underground
- Frazier Substation Reliability Upgrade (900 circuits)
- Dover Air Force Base Substation Relocation
- System Automation
- DNREC R & R Metering
- Public Works Wetland Project
- Washington Street Lights
- NBR Properties, LLC

### **3.3.2 T&D Plant Condition Assessment**

The transmission and distribution system assessment included drive-by observations of a sample of the transmission circuits and distribution circuits. Each of the fifteen substations was physically observed during the tour.

- McKee Substation
- College Park Substation
- Dover Downs Substation
- Frazier Substation
- VanSant Substation
- General Scott Substation
- Division Street Substation
- Mid-City Substation
- Mayfair Substation
- St. Joan's Substation
- Cartanza Substation
- Horsepond Substation

- Danner Farm Substation
- Lebanon Substation
- North Street Substation

In general, the substations appeared to be in acceptable operating conditions. All battery set in the system substations are less than ten years of age. Mr. Harry Maloney, the Electric Department Director, provided a tour of the substations with Ted Kelly on June 4, 2015. The General Scott Substation has relatively new breakers, and the 12-kV switchgear and controls are scheduled to be upgraded in FY 2016. Horsepond Substation was recently rebuilt which included a three breaker 69-kV system for the 69-kV bus and the substation logic was reprogrammed. Work started in late February 2014 and was completed in November 2014. The Dover Downs Substation added a three breaker system for the 69-kV bus and a direct underground feed to Dover Downs. At the Cartanza Substation, Delmarva has expanded their side of the substation. In the near future, the Lebanon Substation will need work on the capacitor bank.

The City has recently completed the process of replacing conductor throughout the entire 69-kV system. In addition, the City has invested heavily in its undergrounding program to increase system reliability. Moving forward, the system will continue to be converted from overhead to underground distribution, but this process has slowed to allow for further evaluation.

### **3.3.3 T&D Plant Conclusion**

It is the opinion of Burns & McDonnell that the design, construction, operation and maintenance of the City's electric transmission and distribution system and the associated facilities are consistent with current generally accepted electric utility standards. In completing Annual Engineering Consultant's Reports over the past several years, Burns & McDonnell has observed that the City has made appropriate system upgrades and improvements. The City and the Electric Division are proactive in preventative maintenance and expansion of the Electric System before problems arise.

## **4.0 – FINANCIAL OVERVIEW AND ASSESSMENT**

## 4.0 FINANCIAL OVERVIEW AND ASSESSMENT

A review of the financial results of the Electric System for the fiscal year ended June 30, 2014, is provided herein.

### 4.1 Required Revenue

The level of revenues required from the retail electric rates for the Electric Division was determined through the analysis of the financial results and net income or net margins for the most recent fiscal year. The City of Dover, Delaware Resolution Authorizing and Securing Electric Revenue Bonds, adopted December 23, 1985 requires that the Electric Division maintain a debt service coverage ratio of 1.25. The following is an excerpt from Section 502(c) of the resolution.

*“(c) The total amount of the Revenues of the Electric System during the preceding fiscal year shall have been not less than the total of the following:*

*(3) The Current Expenses of the Electric System during the current fiscal years shown by the Annual Budget . . . for such fiscal year, and*

*(4) One hundred twenty-five percent (125%) of the maximum amount of the Principal and Interest Requirements for any fiscal year thereafter on account of all bonds then Outstanding under the provisions of this Resolution.*

*The City further covenants that, from time to time and as often as it shall appear necessary, it will adjust the electric rates as may be necessary or proper so that the revenues of the Electric System in each fiscal year will not be less than the total of the amounts set forth in subdivision (c) of this section.”*

### 4.2 Electric Rates

Customers of the Electric Division are charged for the electric service based on rate schedules, tariffs, or contracts that reflect the costs to the Electric Division of providing that service. For purposes of setting electric rates, customers with similar load and service characteristics should be placed in the same rate classification.

A comprehensive cost-of-service and rate design study was completed in 2006 and subsequent rate analyses were completed in 2007 and 2008 to examine revenue requirements and revenue generation. Specifically, the 2006 rate study was conducted to address increased costs associated with a new power supply contract that became effective on July 1, 2006. The rate study recommended combining a number

of rate classes and implementing rate increases on July 1, 2006. The 2006 rate study also recommended an additional increase be implemented on January 1, 2007 to cover increased costs associated with operating the generating station. The 2007 and 2008 rate analyses re-examined Electric Division revenues and expenses and recognized additional revisions to power supply costs. As a result of these analyses, additional rate increases were implemented on July 1, 2007 and July 1, 2008.

The City retained Burns & McDonnell to conduct cost-of-service and rate design study in 2012 followed by an update in 2013. The 2012 study examined revenue adequacy, revenue responsibility, and revenue recovery for the Electric Division. It scrutinized customer classes and proposed adjustments for demand rate components and corresponding changes to energy charges. In May 2013, the City retained Burns & McDonnell to incorporate updated power supply cost projections, and other updates, into the model it developed as part of the 2012 Study. An update to the model and rates analysis was completed in early 2015 to reallocate costs and redesign rates in order to remain regionally competitive. Electric rates are approved by Council on an annual basis. The current rate classes are listed below.

- Residential
- Small Commercial (1 Phase, 3 Phase, 1 Phase Heating, Church, and Municipal)
- Medium Commercial (1 Phase & 3 Phase)
- Large Commercial (3 Phase with Reactive Metering)
- Primary
- Transmission
- Outdoor Development Lighting
- Private Outdoor Lighting

### **4.3 Operating Results**

Table 4-1 presents a summary of the annual energy sales, the average monthly number of customer accounts, and the annual average kilowatt-hour (kWh) energy per customer of the Electric Division for FY 2012 through FY 2014. Annual energy sales were 729.8 GWh in FY 2013, an increase of 1.8 percent from FY 2012. Energy sales decreased to 720.9 GWh in FY 2014, a 1.2 percent decline from FY 2013.

**Table 4-1: Annual Sales and Customer Accounts**

	FY 2012	FY 2013	FY 2014
Energy Sales (kWh)			
Residential	196,388,942	204,759,680	205,302,701
Commercial	230,814,311	232,220,877	230,178,899
Primary	160,560,686	167,144,717	164,218,197
Transmission	122,563,783	119,003,804	114,470,558
Outdoor Lighting	6,681,804	6,704,350	6,724,400
Total Energy Sales	717,009,526	729,833,428	720,894,755
Average Number of Monthly Customers (accounts)			
Residential	19,910	19,990	19,900
Commercial	3,355	3,412	3,412
Primary	39	37	37
Transmission	4	4	5
Outdoor Lighting	811	811	811
Total Customers Accounts	24,119	24,254	24,165
Energy Usage Per Customer (kWh/cust./yr.)			
Residential	9,864	10,243	10,317
Commercial	68,797	68,060	67,462
Primary	4,116,941	4,517,425	4,438,330
Transmission	30,640,946	29,750,951	22,894,112
Outdoor Lighting	8,239	8,267	8,291
Average Usage Per Customer	29,728	30,091	29,832

Table 4-2 presents revenues from sales, revenue per kWh ratios, and average revenue per customer ratios for each revenue classification. Total revenue from sales to electric customers in FY 2014 was \$78.2 million, representing a decrease of \$10.1 million, or 11.5 percent from FY 2013. Total revenue from sales to electric customers includes utility tax revenue and power cost adjustment revenue.

In FY 2014, the average rate revenue per kWh for residential customers was 12.61 cents and the total average rate revenue was 10.85 cents per kWh. The 2014 national average retail prices of electricity to ultimate customers, as published by the US Energy Information Administration (EIA), were 12.50 and 10.45 cents per kWh for residential customers and across all sectors, respectively.<sup>1</sup> For a state-wide comparison, the EIA summarized the Delaware 2014 average monthly utility-level retail sales of

<sup>1</sup> US Energy Information Administration, Table 5.3. Average Retail Price of Electricity to Ultimate Customer, Data for March 2015, Release Date: May 26, 2015. [http://www.eia.gov/electricity/monthly/xls/table\\_5\\_03.xlsx](http://www.eia.gov/electricity/monthly/xls/table_5_03.xlsx) (June 11, 2015)

electricity and associated revenue per kWh to be 13.37 cents per kWh for residential customers and 11.33 cents per kWh across all sectors.<sup>2</sup>

**Table 4-2: Annual Revenues and Sales Ratios**

	FY 2012	FY 2013	FY 2014
<b>Revenue</b>			
Residential	\$ 28,112,242	\$ 28,200,423	\$ 25,882,393
Commercial	31,767,838	29,642,803	25,852,554
Primary	18,056,475	17,809,562	15,619,663
Transmission	12,551,239	11,376,866	9,674,084
Outdoor Lighting	1,460,185	1,301,542	1,158,558
Total Revenue	\$ 91,947,980	\$ 88,331,196	\$ 78,187,252
<b>Revenue/kWh</b>			
Residential	\$ 0.1431	\$ 0.1377	\$ 0.1261
Commercial	0.1376	0.1276	0.1123
Primary	0.1125	0.1066	0.0951
Transmission	0.1024	0.0956	0.0845
Outdoor Lighting	0.2185	0.1941	0.1723
Total Revenue/kWh	\$ 0.1282	\$ 0.1210	\$ 0.1085
<b>Revenue Per Customer</b>			
Residential	\$ 1,412	\$ 1,411	\$ 1,301
Commercial	9,469	8,688	7,577
Primary	462,987	481,340	422,153
Transmission	3,137,810	2,844,216	1,934,817
Outdoor Lighting	1,800	1,605	1,429
Average Revenue Per Customer	\$ 3,812	\$ 3,642	\$ 3,236

The Electric Division's largest cost in providing electric service to its customers in FY 2014 was the wholesale cost of power. The Electric Division purchased power from the PJM Interconnection marketplace through its Energy Manager, TEA. The cost of non-generated power includes energy and demand costs, power supply management expense, PJM charges and credits, generation fuels cost, and capacity charges and credits.

The significance of power supply cost to the Electric Division is illustrated in Table 4-3. The top portion of the Table shows net operating revenue as the difference between total revenues generated by the rates and the cost of power supply.<sup>3</sup> The ratios of power supply cost to sales revenues were calculated for FY

<sup>2</sup> US Energy Information Administration, Table 5.6.B. Average Retail Price of Electricity to Ultimate Customers by End-Use Sector by State, Year-to-Date through December 2014 and 2013, Data for December 2014, Release Date: February 2015. [http://www.eia.gov/electricity/monthly/current\\_year/february2015.pdf](http://www.eia.gov/electricity/monthly/current_year/february2015.pdf) (June 11, 2015)

<sup>3</sup> For the purposes of this Report, the phrase "Power Supply" refers to the sum of the costs of power purchased and power generated. This includes plant costs and the cost of fuel. Power Supply also includes any expenses in the CIP

2012 through FY 2014. As illustrated, the Electric Division's power supply cost as a percentage of rate revenue increased from 63.0 percent in FY 2013 to 73.2 percent in FY 2014.

**Table 4-3: Revenue Margins and Unaccounted for Energy**

	FY 2012	FY 2013	FY 2014
Net Revenue Margins (\$)			
Sales Revenues	\$ 91,947,980	\$ 88,331,196	\$ 78,187,252
Power Supply	58,929,133	55,681,251	57,233,726
Net Revenue Margin	\$ 33,018,847	\$ 32,649,945	\$ 20,953,526
Net Revenue Ratio	64.1%	63.0%	73.2%
Unaccounted for Energy (kWh)			
Power Supply	738,190,000	752,869,000	762,254,000
Energy Sales	717,009,526	729,833,428	720,894,755
Unaccounted for Energy (Losses)	21,180,474	23,035,572	41,359,245
Percentage	2.9%	3.1%	5.4%

Table 4-3 also illustrates the ratio of the amount of energy purchased and delivered to the electric system to total energy sales. This relationship identifies the level of unaccounted for energy in the Electric System. This unaccounted for energy may include energy that was unmetered, metered inaccurately, stolen, lost, PJM transmission line losses, local system line/transformer losses, etc. The bottom portion of Table 4-3 presents these comparisons for the Electric Division for FY 2012 through FY 2014. As shown, the percentage ratio of the unaccounted for energy to the total energy purchased for FY 2014 was 5.4 percent. This is up from 3.1 percent in FY 2013. In previous Annual Engineering Consultant's Reports, Outdoor Lighting energy was recorded as losses. In this report, Outdoor Lighting customer accounts, energy sales, and revenues were recorded as a separate rate class. The impact this modification has on this Financial Overview and Assessment is most pronounced on the Table 4-3 Unaccounted for Energy analysis, as losses are shown to have decreased from corresponding years in previous reports.

Table 4-4 presents a re-creation of the Electric Division's Statement of Revenues, Expenses, and Changes in Unreserved Retained Earnings for the Electric Revenue Fund for FY 2012 through FY 2014. Net income decreased from FY 2013, totaling -\$2.3 million in FY 2014. A decrease in Operating Transfers – Out was based on avoiding the \$2.0 million transfer out from the previous year used to finance the Calpine Project which secured a Purchase Power Agreement and Capacity Agreement in light of the decommissioning Units 1 and 2.

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Fund that are not capital expenses. The phrase "Purchased Power" refers only to the cost of power purchased from the market and other directly associated costs.



**Table 4-4: Comparative Statement of Revenues, Expense,  
and Changes in Unreserved Retained Earnings**

	FY 2012	FY 2013	FY 2014
Operating Revenues:			
Charges for Electric Service	\$ 91,947,980	\$ 88,331,196	\$ 78,187,252
Miscellaneous Services/Incomes	1,581,421	2,354,497	1,287,501
Total Operating Revenues	\$ 93,529,401	\$ 90,685,693	\$ 79,474,753
Operating Expenses:			
General Administration	\$ 5,223,149	\$ 4,470,795	\$ 2,450,884
Power Supply	58,929,133	55,681,251	57,233,726
Transmission/Distribution	3,023,566	3,267,698	3,806,078
Engineering	1,163,379	1,107,231	1,331,909
Metering	205,791	219,010	284,229
System Operations	498,063	544,405	739,406
Utility Tax	1,548,208	1,443,853	1,258,957
Depreciation	4,783,444	4,621,501	4,748,120
Retirees Pension	-	1,115,765	975,700
Retiree Health Care	1,015,731	696,500	513,300
Total Operating Expenses	\$ 76,390,464	\$ 73,168,009	\$ 73,342,309
Net Operating Income	\$ 17,138,937	\$ 17,517,684	\$ 6,132,444
Non-operating Revenues (Expenses)			
Interest Earned			
Operating Fund	\$ 120,876	\$ 190,469	\$ 2,112
Reserved Funds	348,640	506,771	216,010
Net Increase in Fair Value of Investments	45,200	(614,989)	426,399
Interest and Fiscal Charges	(1,283,174)	(1,432,779)	(1,138,739)
Bond Discount Amortized	-		
Gain/(Loss) on Sale of Assets	47,966	5,203	14,439
Total Non-operating Revenues(Expenses)	\$ (720,492)	\$ (1,345,325)	\$ (479,779)
Net Income Before Operating Transfers	\$ 16,418,445	\$ 16,172,359	\$ 5,652,665
Operating Transfers - In	-	8,282	
Operating Transfers - Out	(7,876,288)	(10,000,000)	(8,000,000)
Total Net Operating Transfers	\$ (7,876,288)	\$ (9,991,718)	\$ (8,000,000)
Net Income	\$ 8,542,157	\$ 6,180,641	\$ (2,347,335)

### 4.3.1 Adequacy of Electric Rates

The City's Bond Resolution requires annual revenues of the Electric Division be no less than the total current expenses plus 125 percent of the greatest remaining annual debt service. "Current expenses", as defined in the Resolution, includes all expenses necessary to maintain and repair the Electric System, all administrative expenses, and engineering, legal or other consultant fees. Transfers to reserve accounts and special purpose funds, and allowances for depreciation are specifically excluded from "current expenses."

In order to determine if the City and the Electric Division have met this requirement, the net income shown in Table 4-4 was adjusted to include the interest on bonds, depreciation expense, and other non-cash income and expenses. Table 4-5 summarizes net income adjustments and the calculation of the revenues available for debt service for FY 2012 through FY 2014.

**Table 4-5: Debt Service Coverage**

	FY 2012	FY 2013	FY 2014
Net Income	\$ 8,542,157	\$ 6,180,641	\$ (2,347,335)
Plus Excluded Expenses:			
Operating Transfers - Out	\$ 7,876,288	\$ 10,000,000	\$ 8,000,000
Depreciation	4,783,444	4,621,501	4,748,120
Interest and Fiscal Charges	1,283,174	1,432,779	1,138,739
Bond Discount Amortized	-	-	-
Gain/(Loss) on Sale of Assets	(47,966)	(5,203)	(14,439)
Less Excluded Income:			
Net Increase in Fair Value of Investments	(45,200)	614,989	(426,399)
Interest Earned - Reserve Funds	(348,640)	(506,771)	(216,010)
Revenues Available for Debt Service	<u>\$ 22,043,257</u>	<u>\$ 22,329,654</u>	<u>\$ 10,882,676</u>
Maximum Principal and Interest in Any Year	\$ 3,401,954	\$ 3,401,954	\$ 3,344,404
Debt Service Coverage	<u>6.48</u>	<u>6.56</u>	<u>3.25</u>
Minimum Required Debt Service Ratio	1.25	1.25	1.25

As Table 4-5 illustrates, the City and the Electric Division maintained a debt service coverage ratio each year that exceeded the required 125 percent plus current expenses. Therefore, the revenues generated by the current electric rates have been sufficient to meet the applicable covenants of the Resolution.

Section 502 of the Resolution requires that the annual debt service used in evaluating the revenues is to be the maximum amount for any fiscal year thereafter. Table 4-6 presents the annual totals of principal and interest amounts due on bonds currently outstanding. The calculation of the debt service coverage ratio in Table 4-5 is based on the total maximum debt service expense in any fiscal year. The FY 2014 calculation was based on the total FY 2015 debt service expense of \$3,344,404.

#### 4.4 Status of Revenue Bonds

At the end of FY 2014, the City had two series of outstanding electric revenue bonds that were issued pursuant to the Resolution. On July 1, 2008, the City issued \$22,200,000 in Electric Revenue Bonds (2008 Bonds). The proceeds from the sale of the 2008 Bonds were used (i) to finance or reimburse the

City for improvements to the City's electric system; (ii) to fund a Debt Service Reserve Fund; and (iii) to pay the costs of issuance of the 2008 Bonds.

On November 17, 2010, the City issued \$8,810,000 of Electric Revenue Refunding Bonds (Series 2010). The proceeds from the sale of the Series 2010 Bonds were used (i) to refund the Series 2004 Bonds, and (ii) to pay the costs of issuance of the Series 2010 Bonds. The non-taxable Series 2010 Bonds received an underlying rating of Aa2 by Moody's Investors Services and an underlying rating of A+ by Fitch Ratings.

Table 4-6 illustrates the debt service schedule for the Series 2008 and 2010 Bonds. The principal and interest and the annual total are shown for each series of bonds. At the time of issuance of the Series 2010 Bonds, the combined outstanding principal balance for both series of bonds was \$23,940,000.

**Table 4-6: Debt Service Schedule of Electric Revenue Bonds**

Period	2008 Electric Revenue Bonds			2010 Electric Revenue Refunding Bonds			Total Annual Debt Service
	Principal	Interest	Debt Service	Principal	Interest	Debt Service	
FY 2015	\$ 450,000	\$ 953,704	\$ 1,403,704	\$1,810,000	\$ 130,700	\$ 1,940,700	\$ 3,344,404
FY 2016	475,000	930,579	1,405,579	1,890,000	47,250	1,937,250	3,342,829
FY 2017	695,000	901,329	1,596,329	-	-	-	1,596,329
FY 2018	730,000	865,704	1,595,704	-	-	-	1,595,704
FY 2019	765,000	831,580	1,596,580	-	-	-	1,596,580
FY 2020	800,000	798,706	1,598,706	-	-	-	1,598,706
FY 2021	840,000	763,856	1,603,856	-	-	-	1,603,856
FY 2022	880,000	726,756	1,606,756	-	-	-	1,606,756
FY 2023	925,000	686,694	1,611,694	-	-	-	1,611,694
FY 2024	970,000	644,056	1,614,056	-	-	-	1,614,056
FY 25-34	12,710,000	3,405,972	16,115,972	-	-	-	16,115,972
Total	\$20,240,000	\$ 11,508,936	\$31,748,936	\$3,700,000	\$ 177,950	\$ 3,877,950	\$35,626,886

#### 4.5 Insurance

The City maintains a comprehensive insurance program to insure against varying types of liabilities and significant losses related to various Electric Division properties. Section 706 of the Resolution reads:

*"The City covenants that it will maintain a practical insurance program, with reasonable terms, conditions, provisions and costs, which the City Manager determines, with the approval of the Engineering Consultants, will afford adequate protection against loss, including loss of Revenues, caused by damage to or destruction of the Electric System or any part thereof and also comprehensive public liability insurance on the Electric System for bodily injury and property damage in such amounts as may be approved by the Engineering Consultants."*

Table 4-7 summarizes itemized insurance coverage procured by the City for the period July 1, 2014, through June 30, 2015. Burns & McDonnell has reviewed this list of insurance, and in the opinion of Burns & McDonnell, as Engineering Consultant and not as insurance counselor, the insurance in full force and affect appears to satisfy the requirements of Section 706 of the Resolution.

**Table 4-7: Schedule of Insurance Coverage in Effect**

<b>Starr Technical Risks Agency</b>	July 1, 2014 - June 30, 2015 Coverage
<b>Property</b>	
Earth Movement -Per Occurrence and in the Annual Aggregate, except	\$20,000,000
Earth Movement in High Hazard Earth Movement Zones;	EXCLUDED
Earth Movement in California;	EXCLUDED
Flood -Per Occurrence and in the Annual Aggregate;	10,000,000
Accounts Receivable;	100,000
Business Interruption;	EXCLUDED
Contingent Time Element Coverage;	EXCLUDED
Debris Removal (or 25% of Direct Property Loss, whichever the greater);	2,500,000
Demolition and Increased Cost of Construction;	10,000,000
EDP Media;	1,000,000
Errors and Omissions;	2,000,000
Expediting Expense;	1,000,000
Extra Expense, excluding replacement power or increased cost of generation, transmission and/or distribution of electricity, water or natural gas;	2,000,000
Fire Department Service Charges and Extinguishing Expenses;	500,000
Hazardous Substances -Per Occurrence and in the Annual Aggregate;	500,000
Inland Transit;	2,500,000
Newly Acquired Locations -90 Days reporting;	1,000,000
Personal Property Temporarily Off Premises;	100,000
Course of Construction;	EXCLUDED
Miscellaneous Unnamed Locations (except perils of Flood, Earth Movement and Valuable Papers and Records);	500,000
	100,000

**Deductibles**

All deductibles listed below are per occurrence except with respect to coverage provided under the Boiler & Machinery which shall be any One Accident.

In respect of Damage to Insured Property:

\$750,000 per Occurrence, except;

\$100,000 per Occurrence as respects Transit.

In respect of Time Element loss (Extra Expense):

45 days per Occurrence, except;

72 hours per Occurrence in respect of Service Interruption.

**XL Insurance**

July 1, 2014 -  
June 30, 2015  
Coverage

**Property**

per Occurrence and in the Annual Aggregate in respect of Flood;	\$ 10,000,000
per Occurrence and in the Annual Aggregate in respect of Earth Movement, Excluded. per Occurrence and in the Annual Aggregate applicable in High Hazard Movement zones;	20,000,000
per Occurrence and in the Aggregate in respect Hazardous Substance;	500,000
per Occurrence in respect of Business Interruption;	EXCLUDED
per Occurrence in respect of Accounts Receivable;	100,000
per Occurrence in respect of scheduled, direct Contingent Time Element;	EXCLUDED
per Occurrence in respect of Incidental Course of Construction;	5,000,000
(or 25.00% of the direct physical loss, whichever greater) per Occurrence in respect of Debris Removal;	2,500,000
per Occurrence in respect of Demolition and Increased Cost of Construction;	10,000,000
per Occurrence in respect of Electronic Data Processing Media;	1,000,000
per Occurrence in respect of Errors and Omissions;	2,000,000
per Occurrence in respect of Expediting Expense;	1,000,000
per Occurrence in respect of Extra Expense excluding replacement power of increased cost of generation, transmission and/or distribution of electricity, water or natural gas;	2,000,000
per Occurrence in respect of Fire Department Service Charges and Extinguishing Expenses;	500,000
per Occurrence in respect of Newly Acquired Locations (ninety (90) days reporting);	1,000,000
per Occurrence in respect of property in Course of Inland Transit;	2,500,000
per Occurrence in respect of Miscellaneous Unnamed Locations, except: Excluded. per Occurrence in respect of Flood; Excluded. per Occurrence in respect of Earth Movement; Excluded. per Occurrence in respect of Named Storm;	500,000
per Occurrence in respect of Valuable Papers and Records;	100,000
per Occurrence in respect of Personal Property Temporarily Off Premise.	100,000

**Deductibles / Retentions**

Application of Deductibles as described in Policy form unless otherwise indicated  
in Policy Form Revisions Section, if applicable.

In respect of Damage to Insured Property:

\$750,000, Per Occurrence, except;

\$100,000, per Occurrence as respect Transit;

In respect of Time Element loss (Extra Expense):

45 days per Occurrence except;

72 hours Per Occurrence in respect of Service Interruption

## 4.6 Operating and Reserve Accounts

The Electric Revenue Fund and the Electric Improvement & Extension (I&E) Fund are the City's two funds devoted to the Electric Division. The funds are used to manage cash and transactions related to utility operations and capital expenditures, respectively. Each fund includes certain cash accounts established to make moneys available for specific purposes when they are needed. The accounts maintained within the Revenue and I&E Funds are listed herein.

### Electric Revenue Fund

- Insurance Reserve Account
- Contingency Reserve Account
- Electric Rate Stabilization Reserve Account
- Interest and Sinking Account

### Electric Improvement & Extension Fund

- Depreciation Reserve Account
- Future Capacity Reserve Account

The following are descriptions of each Fund, their respective accounts and their purposes.

### 4.6.1 Electric Revenue Fund

The Electric Revenue Fund was established in Section 503 of the Resolution. All revenues are to be deposited into the Electric Revenue Fund when received. Current expenses are to be paid and other accounts are to be maintained from the Electric Revenue Fund. Moneys are transferred from the Electric Revenue Fund to the Electric Rate Stabilization Reserve Account, the Interest and Sinking Account, the I&E Fund, the Depreciation Reserve Account, and the Future Capacity Reserve Account.

#### 4.6.1.1 Insurance Reserve Account

The Insurance Reserve Account was established by the City to fund insurance deductibles in the event of loss(es) covered by the City's insurance policies then in effect. The target minimum balance in the Insurance Reserve is \$350,000. The reserve balance at the end of FY 2014 was \$737,543. In an effort to reduce insurance premiums, the City approved raising the minimum reserve balance to \$750,000 in 2014. The new minimum balance will be in force in FY 2016; achieved by the accumulation of interest earnings and a \$10,000 appropriation.

#### **4.6.1.2 Contingency Reserve Account**

The Contingency Reserve Account was established by the City in FY 2003 to provide for unplanned expenditures that may not be avoidable. The City's Financial Policies require that a minimum balance be maintained in the Contingency Reserve Account equal to 1.0 percent of the current year revenues for the Electric Revenue Fund. The FY 2014 year-end balance was \$819,136, which is equal to 1.03 percent of the FY 2014 revenues for the Electric Revenue Fund.

#### **4.6.1.3 Electric Rate Stabilization Account**

The Electric Rate Stabilization Reserve Account was established in FY 2005 to offset the costs of the power cost adjustment to the customers of Dover. The account's target balance is a minimum of 3.0 percent, not to exceed 10.0 percent, of purchased power cost in any given year. Any excess of this amount will be refunded to customers in future years by reducing the rate of the power cost adjustment. The account's FY 2014 end-of-year balance was \$10,465,824, which was 20.4 percent of the FY 2014 purchased power cost.

#### **4.6.1.4 Interest and Sinking Account**

The Interest and Sinking Account was established in Section 507 of the Resolution. This account consists of two restricted accounts: the Bond Service account and the Reserve Account. The Bond Service Account is funded with equal monthly transfers from the Electric Revenue Fund such that the balance, as of each payment date for interest or for principal and interest, will be equal to the amount of the payment due. The payments of principal and interest due on bonds are made from the Bond Service Account. The Reserve Account is funded by transfers from the Electric Revenue Fund, as necessary, to maintain a balance equal to the maximum combined principal and interest for any future fiscal year through the life of all bonds then outstanding. Moneys in the Reserve Account are used for paying interest on and principal of bonds when the balance in the Bond Service Account is insufficient for making those payments. Excess moneys in the Reserve Account are also used towards paying current interest payments. The total amount in the Restricted Accounts for the 2008 and 2010 bonds as of June 30, 2014, was \$3,529,445.

#### **4.6.2 Electric Improvement and Extension Fund**

The I&E Fund was established in Section 507 of the Resolution. Funds are transferred to the I&E Fund from the Electric Revenue Fund to the extent that the amount of funds available from the Electric Revenue Fund exceeds the total of the amounts required to be added to the Interest and Sinking Account. The I&E Fund also receives additional funding from the Depreciation Reserve Account, the Future Capacity Reserve Account, and from development receipts. Section 510 of the Resolution indicates that,

except for certain situations, moneys held in the I&E Fund are to be used only for payment of costs of unusual maintenance or repairs, renewals or replacements, obtaining or replacing equipment, constructing extensions, additions, or improvements, and engineering expenses related to the foregoing activities.

#### **4.6.2.1 Depreciation Reserve Account**

The Depreciation Reserve Account represents moneys that have been set aside for the sole purpose of funding renewals and replacements of the Electric System as components or equipment wear out, deteriorate, or otherwise become unsuitable for the intended purpose. Transfers from the Electric Revenue Fund and investment earnings are the only sources of additional moneys for the Depreciation Reserve Account. Transfers to the I&E Fund are made as necessary to fund capital projects. The target appropriation for the Depreciation Reserve Account each year is the excess of depreciation expense for the year over the amount of principal included in debt service payments made during the year. The reserve balance at the end of FY 2014 was \$9,915,104.

#### **4.6.2.2 Future Capacity Reserve Account**

The Future Capacity Reserve Account was established to set aside and accumulate funds from the Electric Revenue Fund for use in evaluating and pursuing activities related to the Electric Division's alternatives for power supply resources for future demand for electricity. The target balance for this reserve is \$10,000,000. The reserve balance at the end of FY 2014 was \$10,064,390.

Table 4-8 presents FY 2012 through FY 2014 year-end summaries of the activity within the cash accounts described above. The Insurance Reserve Account, the Contingency Reserve Account, the Electric Rate Stabilization Reserve Account, and the Interest and Sinking Account are accounts within the Electric Revenue Fund. The Depreciation Reserve Account and the Future Capacity Reserve Account are accounts within the I&E Fund.



**Table 4-8: Reserve Account Activity and Balances**

	Insurance Reserve Account	Contingency Reserve Account	Electric Rate Stabilization Account	Bond Reserve Account	Depreciation Reserve Account	Future Capacity Account
<b>Year Ended June 30, 2012</b>						
Balance in Account on July 1	\$ 403,334	\$ 1,056,788	\$ 6,160,167	\$ 3,519,376	\$ 10,412,221	\$ 9,178,771
Receipts						
Interest Earned	4,661	14,026	69,966	3,443	129,837	126,711
Appropriations	-	-	5,000,000	3,370,068	-	-
Total Funds Available	\$ 407,995	\$ 1,070,814	\$ 11,230,133	\$ 6,892,886	\$ 10,542,058	\$ 9,305,482
Disbursements						
Debt Service Payments	-	-	-	(3,370,054)	(500,000)	-
Transfer to Capital Projects/Ops.	(70,730)	-	(1,000,000)	-	(300,000)	500,000
Balance in Account on June 30	\$ 337,265	\$ 1,070,814	\$ 10,230,133	\$ 3,522,833	\$ 9,742,058	\$ 9,805,482
<b>Year Ended June 30, 2013</b>						
Balance in Account on July 1	\$ 337,265	\$ 1,070,814	\$ 10,230,133	\$ 3,522,833	\$ 9,742,058	\$ 9,805,482
Receipts						
Interest Earned	10,178	16,022	151,991	3,224	172,146	153,208
Appropriations	385,600	-	12,400,000	3,375,534	-	2,100,000
Total Funds Available	\$ 733,043	\$ 1,086,836	\$ 22,782,124	\$ 6,901,591	\$ 9,914,204	\$ 12,058,690
Disbursements						
Debt Service Payments	-	(272,600)	-	(3,375,534)	(58,500)	(54,500)
Transfer to Capital Projects/Ops.	-	-	(5,400,000)	-	-	(2,000,000)
Balance in Account on June 30	\$ 733,043	\$ 814,236	\$ 17,382,124	\$ 3,526,057	\$ 9,855,704	\$ 10,004,190
<b>Year Ended June 30, 2014</b>						
Balance in Account on July 1	\$ 733,043	\$ 814,236	\$ 17,382,124	\$ 3,526,057	\$ 9,855,704	\$ 10,004,190
Receipts						
Interest Earned	4,500	4,900	83,700	3,388	59,400	60,200
Appropriations	-	-	-	3,391,860	-	-
Total Funds Available	\$ 737,543	\$ 819,136	\$ 17,465,824	\$ 6,921,305	\$ 9,915,104	\$ 10,064,390
Disbursements						
Debt Service Payments	-	-	-	(3,391,860)	-	-
Transfer to Capital Projects/Ops.	-	-	(7,000,000)	-	-	-
Balance in Account on June 30	\$ 737,543	\$ 819,136	\$ 10,465,824	\$ 3,529,445	\$ 9,915,104	\$ 10,064,390

## **5.0 – CONCLUSIONS**

## 5.0 CONCLUSIONS

In the preparation of this Engineering Consultant's Report, Burns & McDonnell completed assessments of the electric generating stations and the transmission and distribution system of the City Electric Division. The investigations included interviews, observations, and reviews of FY 2014 expenditures and FY 2015 budgets. In addition, an analysis of the balances of the Improvement and Extension Fund and other funds benefiting the Electric Division was performed. Burns & McDonnell also reviewed the adequacy of the revenues provided by the current retail rates in relation to the requirements of the City of Dover, Delaware Resolution Authorizing and Securing Electric Revenue Bonds, adopted December 23, 1985. A high level assessment of the City's insurance coverage related to the Electric Division was also completed. Based on these reviews and assessments, it is Burns & McDonnell's opinion that:

1. The City's power generation facilities are being operated and maintained consistent with accepted electric utility practice in the United States.
2. The design, construction, operation, and maintenance of the City's electric transmission and distribution system and the associated facilities are consistent with current generally accepted electric utility standards and over the past few years. The system has been upgraded in order to improve operation and service to customers.
3. The Electric Division capital projects included in the City's Capital Investment Plan and the FY 2015 Operating Budget are necessary and should provide improved reliability and power quality for the Electric System.
4. The balances as of June 30, 2014 for the various reserve funds maintained by the City for the Electric Division appear to be sufficient for their defined purposes.
5. The insurance coverage in full force and affect as maintained by the City related to the various assets of the Electric Division appears to satisfy the requirements of Section 706 of the Resolution.
6. The electric revenues generated by the City's current retail rates are more than sufficient to fulfill the debt service coverage requirement defined in Section 502(c) of the Resolution.





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