



## Commercial Utility Meters

### WHAT WE DID

The purpose of this audit was to evaluate whether commercial customers' electric, gas, and water utility consumption was being accurately and completely read by the City's AMI meters. Accurate and complete meter readings are essential to ensure City customers are properly billed and the City collects revenues based on the level of utility consumption.

### WHAT WE CONCLUDED

We concluded the City's AMI meters were correctly reading commercial customers' electric utility consumption. With respect to gas and water, we concluded the City's AMI meters were correctly reading commercial consumption; however, audit tests identified some opportunities for improvement. More specifically:

- Audit testing identified one gas meter inaccurately measuring consumption due to an improper pressure setting. In this case, the commercial customer was overcharged more than \$10,000 over a 13-year period. Management corrected the improper meter setting and associated overbilling.
- For water meters, although the meters were correctly reading consumption, audit testing confirmed a known and ongoing issue with radio module failures that has resulted in routine physical meter readings and the replacement of failed radio modules. Under a 2012 Agreement, the City has been receiving warranty radio module parts at no additional cost and has an opportunity under the agreement to pursue reimbursement of associated labor and resource costs.
- Customer Operations staff has implemented a practice of performing analytical review of utility customer billings to help ensure their accuracy and identify any issues before the customer is billed. However, the analytical review procedures had not been reduced to writing.

### OPPORTUNITIES FOR IMPROVEMENT

- Underground Utilities and Public Infrastructure (UU&PI) management should continue efforts to replace failed and failing radio modules and monitor these replaced radio modules for performance under the contract warranty.
- Management should designate a City liaison to actively work with the vendor to ensure prompt resolution of any radio module performance issues. The designated liaison should work with the City Attorney to pursue reimbursement of any applicable labor and resource costs under the terms of the 2012 Agreement.
- Management should consider sampling gas meters for proper pressure settings to determine whether the instance identified through audit testing is an anomaly or a commonly occurring issue warranting additional management attention.
- Customer Operations management should continue efforts to reduce to writing the analytical review processes established to help ensure accurate and complete customer utility billings.

# Report #1901 Audit of Commercial Utility Meters



January 30, 2019

City of Tallahassee  
Office of the City Auditor

Joseph K. Maleszewski, City Auditor  
MBA, CIA, CGAP, CISA, CIG, CIGA, CIGI, CCEP



## TABLE OF CONTENTS

---

EXECUTIVE SUMMARY .....	3
WHAT WE DID .....	3
WHAT WE CONCLUDED .....	3
OPPORTUNITIES FOR IMPROVEMENT .....	4
OBSERVATIONS.....	5
Observation 1: Commercial Electric Meters .....	5
Observation 2: Commercial Gas Meters .....	6
Observation 3: Commercial Water Meters .....	7
Observation 4: Commercial Water Meter Radio Modules .....	8
Observation 5: 2012 Implementation Plan Agreement .....	10
Observation 6: Analytical Review of Utility Billings .....	12
APPENDIX A - BACKGROUND .....	14
APPENDIX B - PURPOSE, SCOPE, AND METHODOLOGY .....	18
APPENDIX C - ACTION PLAN.....	19
APPENDIX D - MANAGEMENT RESPONSE.....	20
DISTRIBUTION.....	22
ACKNOWLEDGMENTS .....	22
PROJECT TEAM.....	23
STATEMENT OF ACCORDANCE.....	23

# Audit of Commercial Utility Meters

## EXECUTIVE SUMMARY

### WHAT WE DID

---

The purpose of this audit was to evaluate whether commercial customers' electric, gas, and water utility consumption was being accurately and completely read by the City's advanced metering infrastructure (AMI) meters. Accurate and complete meter readings are essential to ensure City customers are properly billed and the City collects revenues based on the level of utility consumption. Additional metering program information is provided in Appendix A.

### WHAT WE CONCLUDED

---

We concluded the City's AMI meters were correctly reading commercial customers' electric utility consumption. (Observation 1) With respect to gas and water, we concluded the City's AMI meters were correctly reading commercial consumption; however, audit tests identified some opportunities for improvement. More specifically:

- Audit testing identified one gas meter inaccurately measuring consumption due to an improper pressure setting. In this case, the commercial customer was overcharged more than \$10,000 over a 13-year period. Management corrected the improper meter setting and associated overbilling. (Observation 2)
- For water meters, audit testing confirmed a known and ongoing issue with failing radio modules connected to the water meter that has resulted in routine physical meter readings and the replacement of failed radio modules. Under a 2012 agreement, the City has been receiving warranty module parts at no additional cost and has an opportunity under the agreement to pursue reimbursement of associated labor and resource costs. (Observations 3, 4, and 5)

Customer Operations staff has implemented a practice of performing analytical review of utility customer billings to help ensure their accuracy and identify any issues before the customer is billed. However, the analytical review procedures had not been reduced to writing. (Observation 6)

## **OPPORTUNITIES FOR IMPROVEMENT**

---

Underground Utilities and Public Infrastructure (UU&PI) management should continue efforts to replace failed and failing radio modules and monitor these replaced radio modules for performance under the contract warranty.

The General Manager of Energy Services should coordinate with the Interim General Manager of UU&PI and the Chief Customer Officer over Customer Operations and designate a City liaison to actively work with the vendor to ensure prompt resolution of any radio module performance issues. The designated liaison should work with the City Attorney to pursue reimbursement of any applicable labor and resource costs under the terms of the 2012 Agreement.

Management should consider sampling gas meters for proper pressure settings to determine whether the instance identified through audit testing is an anomaly or a commonly occurring issue warranting additional management attention.

Customer Operations management should continue efforts to reduce to writing the analytical review processes established to help ensure accurate and complete customer utility billings.

## OBSERVATIONS

Element	<b>Observation 1: Commercial Electric Meters</b>
Criteria	The City Commission established the rates for which electric consumption will be assessed. To help ensure commercial electric customers are being billed fairly, consumption should be accurately and completely read and transmitted.
Condition	Based on the audit work performed, commercial electric utility consumption was being accurately and completely read and transmitted by the City's AMI meters.
Cause	City management has effectively implemented AMI metering for its commercial electric utility customers.
Effect	Accurate and complete meter readings help ensure City electric customers are properly billed based on the level of consumption.
Recommendation	No recommendation(s).
Response	We concur with your observation that commercial electric utility consumption was being accurately and completely read and transmitted by the City's AMI meters.

Element	Observation 2: Commercial Gas Meters
Criteria	<p>The City Commission established the rates for which gas consumption will be assessed. To help ensure commercial gas customers are being billed fairly, consumption should be accurately and completely read, and transmitted.</p> <p>To ensure an accurate measuring of gas consumption, the meter pressure sensor reading must match the delivered pressure (the pressure in the gas supply line to the customer).</p>
Condition	<p>In all but one instance, commercial gas utility consumption was accurately and completely read, and transmitted by the City's AMI meters. Our comparison of the delivered pressure for a sample of 37 commercial gas customers disclosed that for one customer, the meter sensor reading did not match the delivered pressure. In the instance identified, the meter read five pounds per square inch (psi) for each two psi delivered.</p>
Cause	<p>The meter pressure sensor setting did not match the actual delivered gas pressure.</p>
Effect	<p>Customer Operations determined the customer was due a refund of \$10,524.81 based on overbillings from October 2005 to March 2018.</p>
Recommendation	<p>The City's gas meter shop corrected the meter pressure the day the issue was identified. On March 22, 2018, Customer Operations credited the customer's account for overbillings totaling \$10,524.81.</p> <p>To provide additional assurance regarding the accuracy of the gas meters, we recommend management consider sampling gas meters for proper pressure sensor readings to determine whether the instance identified through audit testing is an anomaly or a commonly occurring issue warranting additional management attention.</p>
Response	<p>We concur that commercial gas utility consumption was accurately and completely read and transmitted by the City's AMI meters. As noted in your report, staff took timely corrective action to address the one instance where the meter delivery pressure setting required adjustment.</p> <p>We concur with your recommendation to sample additional gas meters for proper pressure sensor readings.</p>

Element	<b>Observation 3: Commercial Water Meters</b>
Criteria	The City Commission established the rates for which water consumption will be assessed. To help ensure commercial water customers are being billed fairly, consumption should be accurately and completely read and transmitted.
Condition	Based on the audit work performed, commercial water consumption was being accurately and completely read by the City's AMI meters.
Cause	City management has effectively implemented AMI metering for its commercial water utility customers.
Effect	Accurate and complete meter readings help ensure City water customers are properly billed based on the level of consumption.
Recommendation	No Recommendation(s).
Response	We concur with your observation that commercial water customers meters were being accurately and completely read and transmitted by the City's AMI meters.



Element	<b>Observation 4: Commercial Water Meter Radio Modules</b>
Criteria	<p>The City Commission established the rates for which water consumption will be assessed. To help ensure commercial water customers are being billed fairly, consumption should be accurately and completely read and transmitted.</p>
Condition	<p>Radio modules are connected to the water meters which transmit read data from the meters. For six (6) of the 61 commercial water meters we tested (10%) were failing, confirming a known and ongoing issue (since 2008) for radio modules installed on both residential and commercial water meters. This issue was initially addressed, in part, by the City entering into an <i>Implementation Plan Agreement</i> (2012 Agreement) that, among other things, provides for the replacement of the original radio modules and for a warranty on the replacement radio modules.</p> <p>The City indicated that as of the time of our fieldwork testing, over 11,000 of the replacement radio modules have failed and been replaced by UU&amp;PI staff under the warranties. UU&amp;PI staff indicated that because of the warranties provided in the 2012 Agreement, the City has been able to avoid paying approximately \$1 million for the 11,000 radio modules (approximately \$90 per radio module).</p> <p>Further information on the 2012 Agreement is discussed in Observation 5. Also, additional information on the radio module malfunctions is provided in Appendix A.</p>
Cause	<p>UU&amp;PI staff learned the radio module failures are attributable to a capacitor. They explained the capacitor overheats and fails, subsequently draining the battery power, which renders the radio module inoperative.</p>
Effect	<p>Failing radio modules prevent the City from meeting its goal to have an automated water meter reading process and requires manual meter reading to achieve the goal of accurate and timely meter readings. Furthermore, failing radio modules require additional labor for radio module replacement.</p> <p>Customer Operations reported as of August 2018, approximately 10,000 water meters (12% of the total number of commercial and residential customer water meters) are physically read each month due to radio module and encoder<sup>1</sup> issues. In addition to staff being diverted from the performance of other duties to read meters, radio module failures inhibit the AMI metering system from providing detailed customer consumption data in the e+ online system.</p>

---

<sup>1</sup> Devices called “encoders” are installed on gas and water meters to convert their mechanical meter readings into electronic data. Customer Operations and UU&PI staff reported the encoder issues are of lesser concern than to the radio module issues.

<b>Recommendation</b>	We recommend UU&PI management continue efforts to replace failed and failing radio modules and monitor the replaced radio modules for performance under the 2012 Agreement and any additional vendor-provided warranties.
<b>Response</b>	We concur with your observation that radio modules, which are connected to the water meters and transmit read data from the meters, are failing at an unacceptable rate. This is a known and ongoing issue which was addressed by the Implementation Plan Agreement in 2012. We have taken advantage of warranties provided in the 2012 Agreement to avoid paying approximately \$1 million for replacement radio modules.

Element	<b>Observation 5: 2012 Implementation Plan Agreement</b>
<b>Criteria</b>	As discussed in Observation 3, a 2012 Implementation Plan Agreement (2012 Agreement) was negotiated by the City and the AMI metering system vendor. Under the terms of this agreement, the vendor replaced all radio modules at the time the 2012 Agreement was executed and warranted the replacement radio modules. The 2012 Agreement also requires the City and the vendor meet regularly to ensure the issues causing radio module failures are fully resolved.
<b>Condition</b>	<p>Since 2012, a number of the replacement radio modules have failed during the warranty period and have been subsequently replaced at no additional cost under the provisions of the 2012 Agreement. Customer Operations staff estimates that on average nearly 1,900 residential and commercial radio modules fail each month.</p> <p>City staff had not, during the period covered by our audit, met with the vendor regarding the performance of the radio modules.</p> <p>The City has not yet submitted a claim requesting reimbursement for City-incurred labor and resource costs as a result of the radio module failures. As of August 2018, UU&amp;PI staff estimated there were over 11,000 failed radio modules replaced using City labor and resources.</p>
<b>Cause</b>	Management had not enforced all warranty provisions of the 2012 Agreement and had not met with the vendor to reach a mutually acceptable resolution to the continuing radio module failures.
<b>Effect</b>	The City received warranty water meter radio modules under the 2012 Agreement but had not received City-incurred labor and resource costs associated with the reimbursement of the over 11,000 failed radio modules.
<b>Recommendation</b>	<p>Subsequent to the completion of audit fieldwork, City staff from Customer Operations, Energy Services, and UU&amp;PI met with the vendor to discuss the AMI metering program and the radio module failure issues. Staff reported the vendor expressed willingness to work towards a satisfactory resolution.</p> <p>We recommend the General Manager of Energy Services coordinate with the Interim General Manager of UU&amp;PI and the Chief Customer Officer over Customer Operations and designate a City liaison to actively work with the vendor through the 2012 Agreement warranty and any additional vendor-provided warranties to ensure prompt resolution of any water meter module performance issues.</p> <p>We recommend the designated liaison work with the City Attorney to pursue reimbursement of any applicable labor and resource costs under the terms of the 2012 Agreement.</p>

**Response**

As noted in observation 4, we concur that radio modules are failing at an unacceptable rate. Subsequent to the completion of your audit fieldwork, staff from Customer Operations, the Electric & Gas Department, and UU&PI met with the vendor to discuss the AMI metering program and the radio module failure issues and the vendor expressed willingness to work towards a satisfactory resolution.

We concur with your recommendation to designate a City liaison to actively work with the vendor to ensure prompt resolution of any water meter module performance issues and to work with the City Attorney to pursue reimbursement of any applicable labor and resource costs under the terms of the 2012 Agreement.

Element	<b>Observation 6: Analytical Review of Utility Billings</b>
Criteria	<p>It is incumbent upon City staff to ensure accurate and complete customer billing for utility consumption.</p> <p>Both City Commission Policy No. 220, <i>Internal Control Policy</i>, and City Administrative Policy No. 630 <i>Internal Control Guidelines</i>, require appropriate internal controls including directive and detective controls communicated in the form of policies and procedures.</p>
Condition	<p>Customer Operations performs analytical reviews of customer utility accounts prior to billing customers. These reviews help identify unreasonable usage numbers that may be reflected in billings and may be an indication of billing errors and/or equipment malfunctions. For example, the reviews may identify situations in which utility usage is shown for electricity and gas, but unreasonably, and possibly in error, no water usage is shown.</p> <p>These analytical reviews are performed by experienced Customer Service staff, including the Utility Business Systems Administrator and the Assistant Utility Accounts Officer who both will soon be eligible for retirement.</p> <p>Procedures relating to the analytical review of utility billings had not been reduced to writing, although such procedures were under development.</p>
Cause	<p>Management recognized the benefit of performing analytical reviews of customer utility accounts prior to billing customers, but have implemented this practice without the benefit of formally documented procedures to consistently direct this activity.</p>
Effect	<p>Absent the development and communication of procedures, the analytical reviews may not always be completed in a consistent, timely, efficient, and effective manner.</p>
Recommendation	<p>To ensure the proper performance of these reviews, procedures should be formally documented that, among other things, describe the steps to be taken and the types of reporting that may be associated with problematic billings.</p> <p>We recommend Customer Operations management complete the development of the written procedures for the analytical review of customer utility billings.</p>
Response	<p>We concur with your observation that Customer Operations performs analytical reviews of customer utility accounts prior to billing customers which identifies unreasonable usage numbers that may be reflected in billings. These reviews, performed by experienced staff, helps ensure accurate and complete customer billing for utility consumption and commend staff for their diligence.</p>

	<p>We concur with your recommendation to complete the development of the written procedures for the analytical review of customer utility billings so that this excellent process will continue as staff turns over.</p>
--	--

## APPENDIX A - BACKGROUND

The City of Tallahassee's utility consumption revenues are defined as those revenues generated by the sale of electricity, gas, and water to commercial and residential customers. The consumption is measured by meters placed at each service point, with the City's Energy Services Department maintaining approximately 120,000 electric meters and 31,000 natural gas meters, and UU&PI maintaining approximately 85,000 water meters.

As Table 1 depicts, the City's electric, gas, and water utilities collectively generated \$299 million of consumption revenue during the 2017 fiscal year. Of this amount, approximately \$156 million (52%) was earned by commercial accounts.

<b>Utility</b>	<b>Commercial</b>	<b>Residential</b>	<b>Totals</b>
Electric	\$131,705,049	\$115,717,611	\$247,422,660
Gas	\$14,690,676	\$9,971,914	\$24,662,590
Water	\$9,842,721	\$16,886,857	\$26,729,578
<b>Total</b>	<b>\$156,238,446</b>	<b>\$142,576,382</b>	<b>\$298,814,828</b>

The City began an initiative in 2008 to install advanced metering infrastructure (AMI) meters for the City's electric, gas, and water utility services. These AMI meters automatically measure utility reading and electronically submit the amount of electricity, natural gas, and water consumed. This information is transmitted to the City's utility billing system, the PeopleSoft Customer Information System (CIS), for use in generating customer utility bills. Consumption information is also made available to customers so they may better manage their utility usage. Customer Operations is responsible for the utility billings provided to the City's utility customers.

Benefits of the AMI metering initiative are to: (1) minimize manual meter reading, (2) increase the detail and variety of information relating to utility consumption available to both the City and its customers, and (3) allow the City to more quickly identify abnormal customer usage, such as with potential water leaks before a customer is billed.

### **AMI Metering System**

In 2008, the City contracted for the installation of an AMI metering system, which provides automated measurements of the electric, gas, and water utility readings of City customers. In addition to the automation of the meter reading process, the AMI metering system allows customers to review their daily usage online (through the City's e+ online portal) and facilitates the electronic transmission of meter readings from the meter to the CIS.

Below is a summary of the typical data flow from the AMI meters to CIS:

1. Devices called “encoders” are installed on gas and water meters to convert their mechanical meter readings into electronic data. (Electric meters do not require encoders because the meters measure consumption in a digital format.)
2. Devices called “radio modules” (radio modules) are also installed at the meter sites and transmit or relay the electronic readings from electric meters (and from the encoders for gas and water meters) to “gatekeepers” which capture electronic meter data from the radio modules for a particular area, such as a neighborhood or subdivision.
3. Gatekeepers relay the data to the Energy Access Management System (EAMS) software application, which collects the data from all gatekeepers throughout the City.
4. EAMS then relays the data to the Meter Data Management System (MDMS) software application which interprets and organizes the data. The data is then imported to CIS and displayed in the e+ online portal for customer use.
5. CIS receives periodic readings from MDMS to use for billing purposes. Monthly bills are generated by CIS in the Customer Operations department and sent to customers for review and payment.

#### **AMI Meter Accuracy**

Notwithstanding the benefits derived from the AMI metering system’s automation of the meter reading process, some opportunity for errors in consumption readings and the resulting customer billings continue to exist. Those errors include, but are not limited to, errors resulting from a failure to adjust the system to address instances in which the amount of electricity, natural gas, or water delivered is not measured accurately because of meter capacity or setting, and from meter malfunction. These opportunities for error are described in more detail in succeeding paragraphs.

While consumption of electricity is measured at the meter and electronically transmitted to the CIS, additional steps are necessary to calculate the actual electricity consumption and billings for large commercial customers. For certain large customers, the amount of power that passes through the meter (the consumption) may exceed the meter’s capacity to completely read the usage. Under such circumstances, the meter reading must be multiplied by a constant (or “multiplier”) to obtain the true consumption for the billing period. The constant is to be recorded in CIS and used to multiply the monthly consumption reading in order to correctly calculate the customer’s consumption for the month. Should the correct constant (or multiplier) not be recorded in CIS, the customer could be over or under-billed each billing period.

Similarly, for gas meters, the meter capacity or setting must match the pressure delivered to the customer (i.e., the pressure in the supply line to the customer). That is, for example, if the delivered pressure at a gas meter is two pounds per square inch (psi); the meter must also be set to read consumption at two psi. If the pressure delivered exceeds the meter setting, the customer will be



underbilled for consumption. If the pressure delivered is less than the meter setting, the customer will be overbilled.

### **Water Meter Malfunctions**

UU&PI staff stated the radio modules installed on the water meters of commercial and residential customers have, in many cases, failed since the implementation of the AMI metering system in 2008. Because the radio modules began failing early into the AMI metering implementation project, the City negotiated an Implementation Plan Agreement in November of 2012 (2012 Agreement) with Elster (which was acquired by Honeywell in 2016), the vendor who supplied the AMI metering equipment and software, and Honeywell, the vendor who served as the AMI metering implementation project manager. Among other things, the 2012 Agreement:

- Required Elster to replace all radio modules installed at that time;
- Provided for a warranty with two stages, the first of which covers the first five years following replacement radio module installation, and the second, which covers the succeeding ten-year period. During the first stage, Elster is to cover 100% of the direct costs of removal labor, costs of replacement radio modules, costs of other related materials, and installation labor. During the second stage of the warranty, the contractor is to waive a gradational portion of the cost of the replacement radio modules, beginning in the first year at 100% and decreasing by 10% each subsequent year; and
- Stipulated the City, Honeywell, and Elster would meet at least annually for the remainder of the terms of all warranties and extended warranties related to the implementation of the AMI metering system.

Although all of the commercial and residential customer radio modules have been replaced by the vendor, as required in the 2012 Agreement, Customer Operations staff indicated there continue to be water meter module failures (for example, according to Customer Operations staff, the failures averaged approximately 1,900 each month from January through August of 2018). As of the completion of our fieldwork, over 11,000 of the replacement radio modules had failed and been replaced. UU&PI staff indicated that because of the warranties provided in the 2012 Agreement, the City has been able to avoid paying approximately \$1 million for the 11,000 radio modules would have otherwise cost (approximately \$90 per module).

UU&PI learned the module failure is attributable to a capacitor located inside the module. The capacitor overheats and fails, subsequently draining the power from the module's battery, leading to battery failure, which renders the module inoperative. Module failures are typically identified by the City's Customer Operations Department through reports designed to detect customer accounts for which meter data has not been transmitted to CIS.

In addition to the module failures, water meters may malfunction for other reasons, including when, for example: (a) A meter has physical damage or (b) The meter has a faulty encoder or connection to the encoder (encoder error) which prevents the encoder from converting the analog meter reading into a digital format.

Customer Operations reported as of August 2018, approximately 10,000 water meters (12% of the total number of commercial and residential customer water meters) were being physically read each month because of module or encoder issues. It was noted that Customer Operations staff must be diverted from the performance of other duties in order to manually read these meters. Also, with the AMI metering system not working as designed, detailed consumption data is not available in the e+ online system for some customers.

### **AMI Meter Monitoring**

The City has steps in place to reduce the likelihood of billing errors should a meter malfunction occur. One such step involves an analytical review by Customer Operations staff of the monthly customer billings. The review is designed to identify instances in which consumption is either not reported or it is reported in amounts that are not reasonable in relation to past usage. For example, at a location where there is discernable gas or electric consumption shown during a billing cycle, water consumption should also be reported. Should water consumption not be reported, City staff are to pursue further investigation and diagnosis of the potential problem. For meter module or encoder failures the meter is added to the manual-read route, and Customer Operations staff must manually read the metered consumption each billing cycle until the meter issue is resolved.

In addition to the analytical reviews of reported monthly utility usage, Customer Operations management noted they have a quality control process in place to annually review 300 of the largest utility meters throughout the year (100 each of electric, gas, and water). In this review, Customer Operations staff read the meters and determine whether the physical meter readings match the readings transmitted to CIS, and whether the size of the installed meter matches the size shown in CIS. Additionally, Customer Operations staff verify appropriate multipliers are in place as needed for electric meters. Customer Operations staff indicated steps are taken to resolve any meter reading issues detected.

## **APPENDIX B – PURPOSE, SCOPE, AND METHODOLOGY**

---

The **purpose** of this audit was to evaluate whether commercial electric, gas, and water utility consumption was being accurately and completely read by City AMI meters.

The **scope** of the audit included evaluating commercial electric, gas, and water meter operations during the time of audit fieldwork (November 2017 through January 2018). We reviewed selected information as early as 2008 when the City’s AMI metering initiative was introduced.

As a part of our audit **methodology** we:

- Interviewed City staff to ascertain how the AMI meters work, how consumption is measured, how meters are currently being read, and how data from the meter is transmitted through the AMI metering system to CIS for billing purposes.
- Conducted site visits to a random and judgmental selection of 58 electric, 80 gas, and 61 water commercial customers’ meters to read the meter and determine if the physical meter reading matched the reading transmitted from the meter, and if the unit of measure (e.g., kilowatt, etc.) observed at the physical meter matched the unit of measure utilized in CIS. Our samples were selected from populations of 13,227 electric commercial customer meters, 1,932 gas commercial customer meters, and 6,793 water commercial customer meters.
- Determined whether the size of the installed water meter matched the size shown in CIS for billing purposes.
- Tested the pressure for 37 of the 80 gas meters equipped with a port that allowed the gas pressure to be manually measured. We observed a physical measurement of the gas pressure being delivered to the customer at all 37 of those meters. We then compared the meter pressure sensor reading to the delivered pressure.

## APPENDIX C - ACTION PLAN

### Audit of Commercial Utility Meters

Action Steps	Responsible Employee	Target Date
1) UU&PI will sample gas meters for proper pressure sensor readings.	Steve Mayfield/ Dean Poppell	3/31/2019
2) UU&PI management will continue efforts to replace radio modules and follow the 2012 Agreement for any additional vendor-provided warranties.	Tim Potter/ Richard Cuyler	In Progress and ongoing
3) The General Manager of UU&PI will coordinate with the General Manager of Electric & Gas and the Chief Customer Officer over Customer Operations and designate a City liaison to work with the AMI hardware vendor to ensure compliance with the 2012 Agreement warranty provisions including hardware replacement and cost reimbursement.	Jennifer Porter/ Rob McGarrah/ James Barnes	3/31/2019
4) Customer Operations management will complete the development of the written procedures for the analytical review of customer utility billings.	Kim Meeks	3/31/2019

## APPENDIX D - MANAGEMENT RESPONSE



**TO:** Joseph K. Maleszewski, City Auditor  
**FROM:** Reese Goad, City Manager  
**DATE:** January 18, 2019  
**SUBJECT:** Response to Audit of Commercial Utility Meters

I am pleased that the Audit of Commercial Utility Meters found that commercial customers' electric, gas, and water utility consumption is being accurately and completely read by the City's advanced metering infrastructure (AMI) meters. I would like to thank the Audit Office for their thorough review and recommendations for improvement.

Below you will find the response of myself and managers of affected departments to the five specific observations in the audit.

**Observation 1: Commercial Electric Meters**

We concur with your observation that commercial electric utility consumption was being accurately and completely read and transmitted by the City's AMI meters.

**Observation 2: Commercial Gas Meters**

We concur that commercial gas utility consumption was accurately and completely read and transmitted by the City's AMI meters. As noted in your report, staff took timely corrective action to address the one instance where the meter delivery pressure setting required adjustment.

We concur with your recommendation to sample additional gas meters for proper pressure sensor readings.

**Observation 3: Commercial Water Meter Radio Modules**

We concur with your observation that commercial water customers meters were being accurately and completely read and transmitted by the City's AMI meters.

We also concur with your observation that radio modules, which are connected to the water meters and transmit read data from the meters, are failing at an unacceptable rate. This is a known and ongoing issue which was addressed by and Implementation Plan Agreement in 2012. We have taken advantage of warranties provided in the 2012 Agreement to avoid paying approximately \$1 million for replacement radio modules.

CITY HALL  
300 South Adams Street  
Tallahassee, FL 32301-1731  
850-891-0000  
TDD: 711 • Talgov.com

JOHN E. DAILEY  
Mayor

REESE GOAD  
City Manager

CURTIS RICHARDSON  
Mayor Pro Tem

CASSANDRA K. JACKSON  
City Attorney

ELAINE W. BRYANT  
Commissioner

JAMES O. COOKE, IV  
City Treasurer-Clerk

JEREMY MATLOW  
Commissioner

JOSEPH MALESZEWSKI  
City Auditor

DIANNE WILLIAMS-COX  
Commissioner

We concur with your recommendation to continue efforts to replace failed and failing radio modules and monitor the replaced radio modules for performance under the 2012 Agreement and any additional vendor-provided warranties.

**Observation 4: 2012 Implementation Plan Agreement**

As noted in observation 4, we concur that radio modules are failing at an unacceptable rate. Subsequent to the completion of your audit fieldwork, staff from Customer Operations, the Electric & Gas Department, and UU&PI met with the vendor to discuss the AMI metering program and the radio module failure issues and the vendor expressed willingness to work towards a satisfactory resolution.

We concur with your recommendation to designate a City liaison to actively work with the vendor to ensure prompt resolution of any water meter module performance issues and to work with the City Attorney to pursue reimbursement of any applicable labor and resource costs under the terms of the 2012 Agreement.

**Observation 5: Analytical Review of Utility Billings**

We concur with your observation that Customer Operations performs analytical reviews of customer utility accounts prior to billing customers which identifies unreasonable usage numbers that may be reflected in billings. These reviews, performed by experienced staff, helps ensure accurate and complete customer billing for utility consumption and commend staff for their diligence.

We concur with your recommendation to complete the development of the written procedures for the analytical review of customer utility billings so that this excellent process will continue as staff turns over.

## **DISTRIBUTION**

---

**Responsible Manager:**

Reese Goad, City Manager

**Internal Distribution:**

Mayor and Members of the City Commission

Appointed Officials

Executive Team

James Barnes, General Manager, Customer Operations

Rob McGarrah, General Manager, Energy Services

Jennifer Porter, Interim General Manager, Underground Utilities and Public Infrastructure

**External Distribution:**

Members of the Audit Committee

External Auditor

## **ACKNOWLEDGMENTS**

---

We would like to express our appreciation to the management and staff of Customer Operations, Energy Services, and Underground Utilities and Public Infrastructure for their cooperation and assistance during this audit.

We were impressed with the technical proficiency and culture of safety among the professionals we interacted with during the performance of our onsite audit fieldwork.

## **PROJECT TEAM**

---

**Engagement was conducted by:**

Patrick A. Cowen, Senior IT Auditor  
CPA, CISA, CIA

**Under the supervision of:**

Don Hancock, Senior Audit Manager  
CPA

**Approved by:**

Joseph K. Maleszewski, City Auditor  
MBA, CIA, CGAP, CISA, CIG, CIGA, CIGI, CCEP

## **STATEMENT OF ACCORDANCE**

---

The Office of the City Auditor's mission is to provide the City Commission an independent, objective, and comprehensive auditing program of City operations; to advance accountability through the provision of assurance and advisory services; and to actively work with Appointed Officials in identifying risks, evaluating controls, and making recommendations that promote economical, efficient, and effective delivery of City services.

We conducted this audit in conformance with the International Standards for the Professional Practice of Internal Auditing and Generally Accepted Government Auditing Standards. Those standards require we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our objectives.

Please address inquiries regarding this report to the Office of the City Auditor at (850) 891-8397 or [auditors@talgov.com](mailto:auditors@talgov.com).

<http://www.talgov.com/transparency/auditor.aspx>