

Memorandum



CITY OF DALLAS
(Report No. A15-009)

DATE: August 7, 2015

TO: Honorable Mayor and Members of the City Council

SUBJECT: Audit of the Design of Controls over the Department of Dallas Water Utilities' Meter-to-Billing Process¹

The Department of Dallas Water Utilities (DWU) has adopted the: (1) International Organization for Standardization (ISO) American National Standard for Quality Management Systems (QMS); and, (2) American Water Works Association (AWWA) standards, requirements, and best practices. Adoption of these standards, requirements, and best practices are important to assist DWU management in the oversight of the meter-to-billing process. The Office of the City Auditor's (Office) design assessment shows that while these standards, requirements, and best practices are largely implemented for the meter-to-billing process (see textbox), there are

Meter-to-Billing Process

The DWU's policy is to provide customers with timely and accurate billing for water and wastewater services through the following meter-to-billing process:

Meters – test and install to record water usage

Water usage – meters read monthly

Meter read data – transferred into Systems, Applications, and Products in Data Processing (SAP) System

SAP System – calculates customer bills; identifies meter read data needing re-reading or adjustments

Customer bills – issued monthly

Source: DWU

¹ This audit was conducted under the authority of the City Charter, Chapter IX, Section 3 and in accordance with the Fiscal Year (FY) 2012 Audit Plan approved by the Dallas City Council. The objective of the audit was to determine whether DWU's customers were accurately and timely billed for water and water related services. The audit scope covered DWU's customer bills processed from October 1, 2010 through September 30, 2012; however, certain other matters, procedures, and transactions outside of that period may have been reviewed to understand and verify information related to the audit period. **Audit Scope Limitation:** From October 2012 through June 2013, the auditors attempted to extract data from the SAP system to conduct detailed audit tests. Even with the assistance of DWU and the Department of Communication and Information Services (CIS), these attempts were unsuccessful as data was not readily available in the system. As a result, the audit was limited to an assessment of the design of the controls over the DWU meter-to-billing process. This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require that 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 objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. To achieve the revised audit objective, we: (1) observed critical stages of the meter-to-billing process, meter testing, meter reading, and manual billing adjustments; (2) interviewed managers and supervisors; (3) evaluated meter reads for accuracy; (4) sampled service orders on exchanged meters; (5) reviewed statistics on significant operations, such as meter exchanges and repairs, the number of customers who contacted DWU, meter reads, and manual billing adjustments; and, (6) reviewed performance monitoring, tracking reports, meter reading, manual billing adjustments, and exception reports. **Note:** On February 4, 2015, DWU informed the Office that access to SAP data may be more readily available through the current SAP third-party contract.

opportunities to strengthen the controls in that process. The design assessment did not include a test of the accuracy of customer bills.

Specifically, the design assessment of DWU's controls for accurately measuring and properly documenting customers' actual water usage when compared to ISO's requirements, shows that the design:

- **Satisfies:**

- General Requirements – The organization shall establish, document, implement, and maintain a QMS and continually improve its effectiveness.

- **Partially satisfies:**

- Management Responsibility – Top management shall provide evidence of its commitment to the development and implementation of the QMS and continually improve its effectiveness.
- Resource Management – The organization shall determine and provide the resources needed.
- Product Realization – The organization shall plan and develop the processes needed for product realization (e.g., customer billings).
- Measurement, Analysis, and Improvement – The organization shall plan and implement the monitoring, measurement, analysis, and improvement processes needed to demonstrate, ensure, and continually improve the effectiveness of the system.

Criteria for Design Assessment		
ISO's Standards	American	National
specify requirements for a QMS used for internal application and certification by focusing on how well the system meets customer requirements. The standards encompass general requirements of the system, management responsibility, resources, product realization, and measurement, analysis and improvement.		
AWWA develops industry standards for products and processes that advance public health and safety by developing authoritative scientific and technological knowledge. The standards and recommended practices promoted by the AWWA are intended to represent a consensus of the water supply industry related to meter accuracy tests, testing equipment, and periodic meters-in-service tests (maintenance).		
Sources: ISO QMS; AWWA		

The design assessment of DWU's controls over the meter-to-billing process compared to AWWA standards and recommended practices show the design:

- **Does not satisfy:**

- Meter Accuracy Tests – All meters should be tested for accuracy of registration at flow rates and test-flow quantities. A statistical

sample testing of new meter shipments to verify accuracy is an efficient cost alternative to testing every new meter. All sampled meters must meet accuracy limits at different flow rates.

- **Partially satisfies:**
 - Testing Equipment – The measuring device that is used to determine the amount of water discharged when testing should be designed to provide measuring accuracy to within 0.25 percent of the actual quantity. Tanks and scales should be tested and calibrated at least once a year and records kept of such tests and calibrations.
 - Periodic Meters-in-Service Tests (Maintenance) – In most cases, it is impossible to ascertain, without actual testing, whether meters-in-service are registering with the required degree of accuracy. Consequently, to ensure reliable meter measurements, it is essential that all meters be subjected to periodic tests.

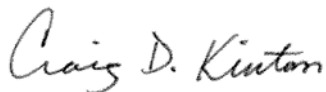
See Attachments I and II for detail support for **Satisfies**, **Partially Satisfies**, and **Does Not Satisfy** and Attachment III for Background.

We recommend the Director of DWU further develop the meter-to-billing process to more fully comply with the ISO and AWWA standards, requirements, and recommended practices.

Please see Attachment IV for Management's Response.

We would like to acknowledge management's cooperation during this audit. If you have any questions or need additional information, please contact me at 214-670-3222 or Carol Smith, First Assistant City Auditor, at 214-670-4517.

Sincerely,



Craig D. Kinton
City Auditor

Attachments

C: A.C. Gonzalez, City Manager
Mark McDaniel, Assistant City Manager
Jo (Jody) M. Puckett, P.E., Director – Department of Dallas Water Utilities

International Organization for Standardization (ISO) American National Standard for Quality Management Systems (QMS) Certification

ISO QMS Requirements	Auditor's Assessment	Comments
<p>1 General Requirements The organization shall establish, document, implement, and maintain a QMS and continually improve its effectiveness.</p>	<p>Satisfies</p>	<p>The Department of Dallas Water Utilities (DWU) <u>satisfies</u> these general requirements.</p> <p>The DWU has established a meter-to-billing process that provides detailed procedures designed to accurately measure and properly document customers' actual water usage as a basis for calculating customer billings. This process contributed to DWU being awarded the ISO QMS Certification in 2012 representing conformity with these requirements.</p>
<p>2 Management Responsibility Top management shall provide evidence of its commitment to the development and implementation of the QMS and continually improve its effectiveness.</p>	<p>Partially Satisfies</p>	<p>The DWU <u>partially satisfies</u> this ISO management responsibility requirement.</p> <p>The DWU demonstrates its commitment to the development and implementation of QMS by conducting: (1) monthly meetings with its Executive Steering Committee (Committee); and, (2) quarterly meetings with the Executive Team. Records of minutes document that these meetings are consistently well-attended by senior executives who discuss issues identified by DWU's own internal ISO Audit Team and the disposition of those issues. Committee members include DWU's Director, the Assistant Directors for Customer Operations, Water Operations, and others. Although DWU internal ISO audits focus on conformity to ISO procedures, the reports did not identify significant issues impacting the quality (accuracy and thoroughness) and efficiency of the meter-to-billing process. As a result, the DWU Executive Team may not be fully informed about accuracy and inefficiency weaknesses in the meter-to-billing process.</p>

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ISO QMS Requirements	Auditor's Assessment	Comments
<p>3 Resource Management The organization shall determine and provide the resources needed.</p>	<p>Partially Satisfies</p>	<p>The DWU <u>partially satisfies</u> this ISO resource management requirement.</p> <p>Through the City of Dallas' (City) annual budget process, DWU determines the human resources, training, and infrastructure needed to maintain the meter-to-billing process and meet customer requirements. The DWU Meter Operations Division (Division) responsible for meter accuracy, however, continues to operate primarily in a manual, paper-based environment, although all other divisions in the meter-to-billing process operate almost entirely in a paperless environment. The manual, paper-based nature of certain Division operations contributed to untimely data entry.</p> <p>A sample test of 80 meters in active accounts was compared to the hard copy service orders involving meter exchanges during Fiscal Years (FY) 2011 and 2012 to determine if the service orders results were entered into the Systems, Applications, and Products in Data Processing (SAP) timely. Test results showed 53 of 80, or approximately 66 percent, of the hard copy service orders could not be located.² Of the 27 hard copy service orders located, 18 instances, or 67 percent, were identified where the service order data was not entered into SAP until weeks and even months had passed. As a consequence, SAP was not timely updated with information to accurately provide the true status and location of meters to meter readers. Untimely updating of service orders may result in inefficiencies such as duplicative service orders, additional call volume for the City's 311 Call Center, and subsequent entries of incorrect billing data.</p> <p>The DWU acknowledged the Division currently operates primarily in a manual, paper-based environment for field activities and that their ultimate goal is to increase the timeliness of service orders. In FY 2013, DWU submitted a Business Technology Request (BTR) to the Information Technology Executive Committee for a "Field Mobility and Inventory Solution" to modernize the Division's operations. According to DWU, this solution would allow service order results to be timely entered electronically into SAP. The solution was approved in FY 2014 and was partially funded. The DWU has not addressed how the challenges described above would be solved with a partially funded solution. The DWU stated that the initial funding for this solution is to launch the project, but it would not resolve the untimeliness of service orders immediately.</p> <p>In addition, to avoid service order duplication in the future caused by untimely updating of service orders, DWU added two provisions to its FY 2013 Service Level Agreement with the department that manages the City's 311 Call Center. The first provision states no duplicate service order is to be created if there is a pending/open service order for the same meter and service. The second provision created an agreed upon escalation process when customers call in again on the same matter.</p>

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Audit of the Design of Controls over the Department of Dallas Water Utilities' Meter-to-Billing Process

ISO QMS Requirements	Auditor's Assessment	Comments
<p>4 Product Realization The organization shall plan and develop the processes needed for product realization (e.g., customer billings).</p>	<p>Partially Satisfies</p>	<p>The DWU <u>partially satisfies</u> this ISO product realization requirement.</p> <p>The DWU planned and developed a meter-to-billing process to identify customer requirements for timely and accurate billing which included:</p> <ul style="list-style-type: none"> In October 2012, DWU upgraded software that interfaces with SAP. The software uploads meter reading data into the SAP production environment. Personnel from both DWU and the Department of Communication and Information Services (CIS) have responsibilities under the change management process.³ An important responsibility includes obtaining approval from the Release Control Board (RCB) before implementing the changes in SAP's production environment. Only after RCB approval can changes be implemented in SAP's production environment. The CIS assisted the auditor in examining this case and found there were actually two upgrades to the software. The first upgrade was in October 2012 and six months later the software was upgraded again. The CIS noted that test documentation was not in the system and the changes were implemented without being presented to the RCB for approval. According to CIS personnel, CIS currently has a more robust change management process to ensure change management procedures are followed as a result of implementing recommendations from an audit report by the Office of the City Auditor (Office).

² The sampled service orders that were not located also involved meter exchanges; however, according to DWU, they may have been filed under a different type of service (such as meter inspections or leaks) performed in the field at the same time. According to DWU, the filing system was subsequently revised to facilitate locating hard copy service orders.

³ Change management describes a process for controlling the life cycle of all changes that are beneficial, with minimal disruption to Information Technology (IT) services. Adequate documentation is a necessary subset of the change management process. The DWU's responsibility includes membership on the SAP Change Advisory Board (CAB) which functions to prioritize changes proposed by departmental business units before bringing the change requests and documentation before the RCB. The CIS' responsibility includes reviewing all of the documentation for completeness and ensuring the changes pass quality assurance checks before placing the change requests on the RCB agenda for review at the weekly RCB meeting.

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ISO QMS Requirements	Auditor's Assessment	Comments
		<ul style="list-style-type: none"> • The DWU also significantly changed two SAP automated accuracy controls without providing documentation justifying how these changes make the controls more effective. Specifically: <ul style="list-style-type: none"> ○ In 2008, during the SAP System implementation, DWU raised tolerance settings on the control designed to detect meter read errors that appear implausible, rendering the control potentially less effective. The DWU's explanation for this change was to reduce the implausible meter reads to more historical levels and reduce the number of false negatives on the exception report allowing the staff to identify meter read errors more efficiently. Since that time, DWU has not evaluated the tolerance settings to determine if they are appropriate. ○ In order to prevent interruptions in the billing (revenue) process, DWU replaced the control designed to prevent bills from being repeatedly based on consecutive estimates by agreeing to monitor these estimates manually. For the month tested (December 2011), 262 residential accounts were consecutively estimated anywhere from four to 71 months. Although this number was relatively small compared to the total number of residential accounts (approximately 246,000), it demonstrates the manual control intended to prevent accounts from being consecutively estimated more than three months was not as effective as the automated control.⁴ And furthermore, prolonged use of consecutive estimates has resulted in customers receiving large monthly bills when their meters were finally read. The DWU management said they are working to reduce the number of prolonged consecutive estimates.

⁴ The SAP automated control required the meter to be read before a bill is sent to the customer if the three prior bills were consecutively estimated.

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ISO QMS Requirements	Auditor's Assessment	Comments
<p>5 Measurement, Analysis, and Improvement The organization shall plan and implement the monitoring, measurement, analysis, and improvement processes needed to demonstrate, ensure, and continually improve the effectiveness of the system.</p>	<p>Partially Satisfies</p>	<p>The DWU <u>partially satisfies</u> this ISO measurement, analysis, and improvement requirement.</p> <p>The DWU planned and implemented a process to monitor, measure, analyze, and improve the meter-to-billing process. Weaknesses were noted in supervisory monitoring, data analysis, and performance measures. Specifically:</p> <ul style="list-style-type: none"> <p>Monitoring: The DWU supervisors did not enforce existing procedures that require meter readers to read all meters and check every meter box and lid on site for safety. In 12 of 14 meter locations sampled, the meter box contained a newly installed meter, but SAP information was not timely updated and still showed the meter box was empty. Based on meter reader data, customer bills may not have been based on actual meter reads and the City's General Liability claims risk may have increased where unsafe meter box conditions had been overlooked in the preceding months.</p> <p>Data analysis: The DWU has not demonstrated continuous improvement and effectiveness through analysis for its 5/8-inch meter (primarily residential) replacement program. The DWU's analysis of SAP data from FY 2010 through FY 2012 showed almost 11,340 of the 20,000 meters budgeted for exchange each year occurred before the meters' 15-year warranty period ended. The DWU could not explain how this analysis was used to improve the meter replacement program and subsequently questioned the reliability of the SAP data. The DWU did not provide alternative data and analysis. The consequences of not having reliable SAP data to effectively manage DWU's workload of meter exchanges are operating inefficiencies and potential revenue losses.</p> <p>Performance measures: The DWU does not have a documented overall performance measure for data accuracy for the meter-to-billing process even though billing accuracy is a customer requirement.</p>

American Water Works Association (AWWA) Standards and Recommended Practices

AWWA Standards and Recommended Practices	Auditor's Design Assessment	Comments
<p>1 Meter Accuracy Tests All meters should be tested for accuracy of registration at flow rates and test-flow quantities. A statistical sample testing of new meter shipments to verify accuracy is an efficient cost alternative to testing every new meter. All sampled meters must meet accuracy limits at different flow rates.</p>	<p>Does Not Satisfy</p>	<p>The Department of Dallas Water Utilities (DWU) procedure <u>does not satisfy</u> the standard for accuracy testing.</p> <p>The DWU policy is all meters must meet industry standards for accuracy set by the AWWA. The AWWA standards are referenced in DWU's International Organization for Standardization (ISO) American National Standard for Quality Management Systems (QMS) procedures that define the specifications for meter procurements and for meter accuracy testing.</p> <p>The DWU requires that meters it procures must be accompanied by an affidavit that the meters comply with applicable current AWWA requirements. Manufacturers and distributors shall include a certificate showing they tested each meter procured by DWU for accuracy to AWWA standards. The AWWA standards and DWU's own meter testing procedures require the purchaser, in this case DWU, to test for meter accuracy independently.</p> <p>The DWU's procedure calls for testing a ten percent sample of newly purchased residential meters for accuracy before accepting the entire shipment. The DWU's procedure, however:</p> <ul style="list-style-type: none"> • Does not require the sample to be selected using a statistically projectable method. The DWU's procedure only requires 80 percent of the sample to pass the accuracy tests and allows the sampling procedure to be repeated if test results are not acceptable. None of these procedures and practices conform to AWWA standards. • Uses a lower standard than AWWA in its computation of meter accuracy test results by accepting sampled meters that may have failed one or more accuracy tests.

AWWA Standards and Recommended Practices	Auditor's Design Assessment	Comments
<p>2 Testing Equipment The measuring device that is used to determine the amount of water discharged when testing should be designed to provide measuring accuracy to within 0.25 percent of the actual quantity. Tanks and scales should be tested and calibrated at least once a year and records kept of such tests and calibrations.</p>	<p>Partially Satisfies</p>	<p>The DWU <u>partially satisfies</u> the standard for measuring device accuracy and calibration of tanks and scales.</p> <p>The DWU is equipped with accuracy testing equipment for all sizes of meters, ranging from residential meters which are used by most of DWU's customers to large meters for commercial and industrial customers. The testing equipment for large meters is relatively new and uses a computer for precise measurements; however:</p> <ul style="list-style-type: none"> • The residential meter test equipment is old and requires a number of highly-skilled and precise manual actions which increases the risk that DWU's test results may not consistently meet the AWWA standard for an accuracy measurement of within 0.25 percent of the actual quantity. Test results for a sample of 144 newly purchased residential meters showed 127, or 88.2 percent, were 100 percent accurate at all flow rates and were accepted for use. According to the manufacturer and the published meter specifications, these sample test results were too high to be valid. • According to DWU, its residential meter test bench is accurate. It cites the AWWA M6 manual that states equipment required to test a water meter may be very simple. This manual, however, also specifies the level of precision required of a test bench and that level of precision cannot be achieved with the current test bench. According to DWU, the questionable validity of test results noted by the auditor was not the result of imprecision inherent in the test bench, but rather pertained to employee performance.

3 Periodic Meters-in-Service Tests (Maintenance)

In most cases, it is impossible to ascertain, without actual testing, whether meters-in-service are registering with the required degree of accuracy. Consequently, to ensure reliable meter measurements, it is essential that all meters be subjected to periodic tests.

Partially Satisfies

The DWU partially satisfies the standard for meters-in-service accuracy.

The DWU designed a process and an ISO procedure in which the Systems, Applications, and Products in Data Processing (SAP) automatically provides for maintenance plans to periodically test the accuracy of all large meters. The DWU ISO procedure for maintenance of residential meters-in-service does not call for periodically testing the accuracy of all residential meters; however, it does require residential meters that are out-of-warranty (obsolete) to be replaced every 15 years.

Large meters: The DWU process and ISO procedure for large meter maintenance plans are not fully implemented as follows:

- The DWU periodically tests large meters which register approximately 35 percent of the drinking water produced annually. The DWU, however, cannot rely on the SAP System to identify when large meters should be tested for accuracy because the SAP criteria used to identify the testing frequency is set to the year 9999.

The DWU identified a solution to this problem of incorrectly setting large meters' test plans to the year 9999 and provided an SAP information technology change request (ticket) that shows a solution was requested. The ticket states it is an update to the maintenance plans for wholesale meters and for the top ten industrial users to specify parameters for testing every six months or 12 million gallons. This ticket remained open for over two years. The DWU stated it requested and was issued a new ticket in May 2015 revising the scope to include all meters three inches or larger to ensure field accuracy testing and exchange in the field if necessary.

Residential meters: The DWU ISO procedure to replace residential meters every 15 years is also not fully implemented as follows:

- The DWU's inventory of residential meters-in-service, which register approximately 65 percent of the retail drinking water produced annually, is aging as the number of obsolete meters replaced each year is less than the number that are due for replacement.

Over the next 14 years (based on SAP meter installation dates), the average number of residential meters reaching obsolescence that will need to be exchanged each year will increase to over 24,000 and will spike in 2022 at over 38,000 meters. Obsolete meters that are not timely replaced may contribute to apparent water loss and lost revenue.

AWWA Standards and Recommended Practices	Auditor's Design Assessment	Comments
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The DWU does exchange meters-in-service when residential customers question high bills or believe their meters are malfunctioning. These meter exchanges, however, are prompted by customers rather than by a comprehensive maintenance program. As a result, the DWU does not have a systematic method to test residential meters-in-service to ensure accuracy.

ATTACHMENT III

Background

The Department of Dallas Water Utilities (DWU) was founded in 1881 and currently provides water and wastewater services to approximately 2.4 million people in the City of Dallas (City) and 27 nearby communities. Dallas City Code Chapter 49, *Water and Wastewater*, Section 49-9(g) places the responsibility for water meter testing, installation, exchange, and reading with DWU. Those responsibilities directly affect the accuracy and timeliness of customer billings.

DWU Revenue Sources

The DWU revenue is derived from payments made by customers for monthly billings based upon authorized water and wastewater rates and are calculated using: (1) a customer charge based on meter size; (2) a variable rate based on customer type, (e.g., residential, General Services, Optional General Services, etc.); and, (3) monthly consumption. The DWU has a tiered rate structure – as individual customer consumption increases, the customer is billed at increasingly higher rates. To calculate the variable amount of customer consumption in water bills, water usage is metered.

Metered Water Usage

The DWU is responsible for obtaining accurate meter reads. In Fiscal Year (FY) 2011, DWU read approximately 3.71 million customer meters; in FY 2012, the number of customer meters read rose to approximately 3.74 million.

City Code Chapter 49, *Water and Wastewater*, Sec. 49-9(a) states: *“Unless otherwise provided in this chapter, or by separate written wholesale service contract, a customer shall receive water service only when measured through a meter. The director shall determine the size, type, number, and location of meters and connections to meters to be installed. Each meter shall be read, when possible, once a month and a bill rendered accordingly.”*

As of February 1, 2013, the Systems, Applications, and Products in Data Processing (SAP) records of DWU’s inventory of installed meters show 90,871 (20 percent) were installed more than 15 years ago and 352,571 (80 percent) were installed less than 15 years ago. Most installed meters are residential meters which have a service life (i.e., warranty) of 15 years and are supposed to be replaced before their warranty expires (i.e., obsolescence).

Meter-to-Billing Business Process

Customers are billed based on water usage recorded through the meter-to-billing process. The process begins with installation of meters that have to be tested for accuracy. Once installed, meter readers enter the number reflected on the meter register into hand-held computers. This data is then uploaded into SAP. The SAP's algorithmic formula uses that data to calculate each customer's monthly bill. If SAP's internal controls detect a level of water usage that appears implausible, the customer's meter read data is sent back to be verified before the billing deadline. If customer data is not uploaded by the billing deadline, another SAP algorithm estimates probable water usage. The SAP creates the customer's monthly water bill using this estimate. **Note:** The actual percentage of customers receiving bills based on estimated usage in FY 2011 and 2012 was not readily accessible from SAP reports.⁵ Annually, 3.79 percent of customers' bills are manually adjusted. According to DWU, manual adjustments are processed principally because of leak adjustments, late fee removals, service charges, and meter read corrections.

⁵ The SAP's Z1STOP report includes fire lines and parks that are estimated for most of the year in SAP because their usage is limited to emergencies (fire lines) and seasonal (parks). This report also includes all meters for active and inactive accounts.

Management's Response to the Report

Memorandum

RECEIVED

JUL 06 2015

City Auditor's
Office



DATE: July 6, 2015

TO: Craig D. Kinton, City Auditor

SUBJECT: Response to Audit Report:
Audit of the Design Controls over the Department of Dallas Water Utilities'
Meter-to-Billing Process

Our responses to the audit report recommendations are as follows:

Recommendation I

We recommend the Director of DWU further develop the meter-to-billing process to more fully comply with the ISO and AWWA standards, requirements, and recommended practices.

Management Response / Corrective Action Plan

Agree Disagree

DWU does agree with the Office of the City Auditor's statement, "...design assessment shows that while these standards, requirements and best practices are largely implemented for the meter to billing process, there are opportunities to strengthen controls in that process." We will be looking for opportunities to utilize the tools available through the Center for Performance Excellence and the Lean Six Sigma effort. To that end, DWU offers the following responses to items outlined in Attachments I and II of the above referenced Audit Report:

ISO QMS Requirements:

DWU is dedicated to maintaining ISO Certification through an ongoing commitment to a dynamic QMS process. This is manifested by the Utility Management Systems (UMS) Division and its continuing activities. We do, however, acknowledge an opportunity to improve reporting on issues impacting the quality and efficiency of the meter-to-billing process. DWU will employ the ISO QMS and quarterly Division Management Review (DMR) processes to communicate the key performance measures of data accuracy for the meter-to-billing process to the DWU Executive Team. There are a number of process inputs that can impact the quality and efficiency of the meter-to-billing process. During FY 15-16, we will develop an end to end "flow process" to indicate how all of those pieces fit together, how they are measured and where improvements can be realized. This will allow a review of how the individual measures fit into that flow to better identify potential weaknesses in the controls.

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Additionally, through the DMR process, we will identify those reports that best define the key elements of quality and efficiency in the meter-to-billing process. The procedure for consolidating data will be reviewed to ensure that the critical information from those reports are adequately spotlighted and brought to the attention of the entire DWU Executive Team on a consistent basis.

The DWU Meter Operations Division currently operates primarily in a paper based environment and DWU agrees this can lead to untimeliness of data entry. As part of the DWU/CIS business technology masterplan DWU has identified a field mobility solution that would greatly improve the work process associated with the tasks. The planning and design phase for the Field Mobility project is currently in the SAP Roadmap for FY 15-16 with a forecast budget of approximately \$500,000. Even though the ultimate timing of the project may be impacted by funding realities, a specific path away from a manual, paper-based environment has been recognized and will be implemented as prudently possible.

Since the implementation of SAP in 2008, DWU has not revisited the tolerance settings for identifying possible read errors ("implausibles"). DWU will review the settings on these controls during the next fiscal year. The process for reviewing will be documented and the associated consequences of the change evaluated. If any adjustments are deemed necessary, the changes will be implemented within the more robust CIS change management procedures and ISO standards currently in place.

During FY 15-16, DWU will also revisit the ISO procedure documents for meter reading. The current iteration does not adequately reflect the realities of the environment in which meters are installed, replaced, and read. Many of the same factors that impact the ability to read a particular meter often impact the Meter Operations Division's meter replacement program. Influences of (among other things) weather and its consequences, construction, damage, tenant move in/out and structural modifications all must be considered and appropriately reflected in the documentation and evaluation of the effectiveness of these processes.

American Water Works Association (AWWA) Recommended Practices:

The American Water Works Association publishes a manual entitled, *Water Meters-Selection, Installation, Testing and Maintenance – Manual of Water Supply Practices M6*. As stated in the forward of the manual, the manual discusses "recommended practice; it is not an AWWA standard calling for compliance with certain specifications". Meter Operations revised its new meter testing procedures in May 2015 to meet the *guidelines* regarding the testing of new meters as discussed in Chapter 5 of the fifth edition of AWWA M6. Additionally, DWU has identified funding for a new small meter test bench within the proposed FY 16 budget. Upon approval of the budget, DWU will begin the acquisition process in October 2015.

Currently, DWU uses a manual process to track field accuracy testing and exchanges for meters three inches and larger. The goal of the existing SAP Change Order from May 2015 (ticket #78989) will automate the process for addressing these meters. Meter Operations and the SAP team are reviewing the processes to develop the Business Requirements Document (BRD) during FY 15-16.

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**Audit of the Design of Controls over the Department of Dallas Water Utilities;
Meter-to-Billing Process**

Implementation Date

See specific sections above for schedule.

Responsible Manager

Sheila Delgado, DWU Assistant Director Customer Operations,
Randall Payton, DWU Assistant Director Water Delivery
Ade Williams, DWU Assistant Director Utility Operations

Sincerely,



Jo M. (Jody) Puckett P.E., Director
Department of Dallas Water Utilities



Mark McDaniel
Assistant City Manager

C: A.C. Gonzalez, City Manager

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