DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY

Board of Directors

Audit Committee

Thursday, December 12, 2013

10:30 a.m.

1. **Call to Order**..... Bradford Seamon, Chairperson

2. **Review of Internal Audit Status** …..…… …….....Joseph Freiburger
   A. Telecommunications Review Report
   B. System Development Life Cycle & System Change Management Report
   C. Water Services - Distribution Maintenance Branch Report
   D. Water Services – Distribution Control Branch Report

3. **FY2014 Committee Meeting Schedule**…….... Bradford Seamon

4. **Update on IT Asset and Fleet Inventory**……. Mark Kim

5. **Executive Session**……... Bradford Seamon

6. **Adjournment**……..... Bradford Seamon

Internal Audit Update

Audit Committee Meeting

December 12, 2013

The following represents a summary of the activities and achievements since the September 26, 2013 meeting.

I. Highlights

Performance of scheduled internal audits – Internal Audit performed audit work in seven separate audit areas. Additionally, four final reports were issued to conclude the work performed under the FY2013 Internal Audit Plan (IT SDLC & Change Management, Telecommunications Review, Water Services – Distribution Maintenance, and Water Services – Distribution Control). Three audits from the FY2014 Internal Audit Plan; Legal Operations, Disposal of Assets and Clean Rivers Project Management, are in progress. The chart below depicts the FY2014 planned projects and their status for the fiscal year.

A. **Stage of Audits & Special Projects –** The following represents an indication of the stage of completion for each scheduled audit and requested special projects.

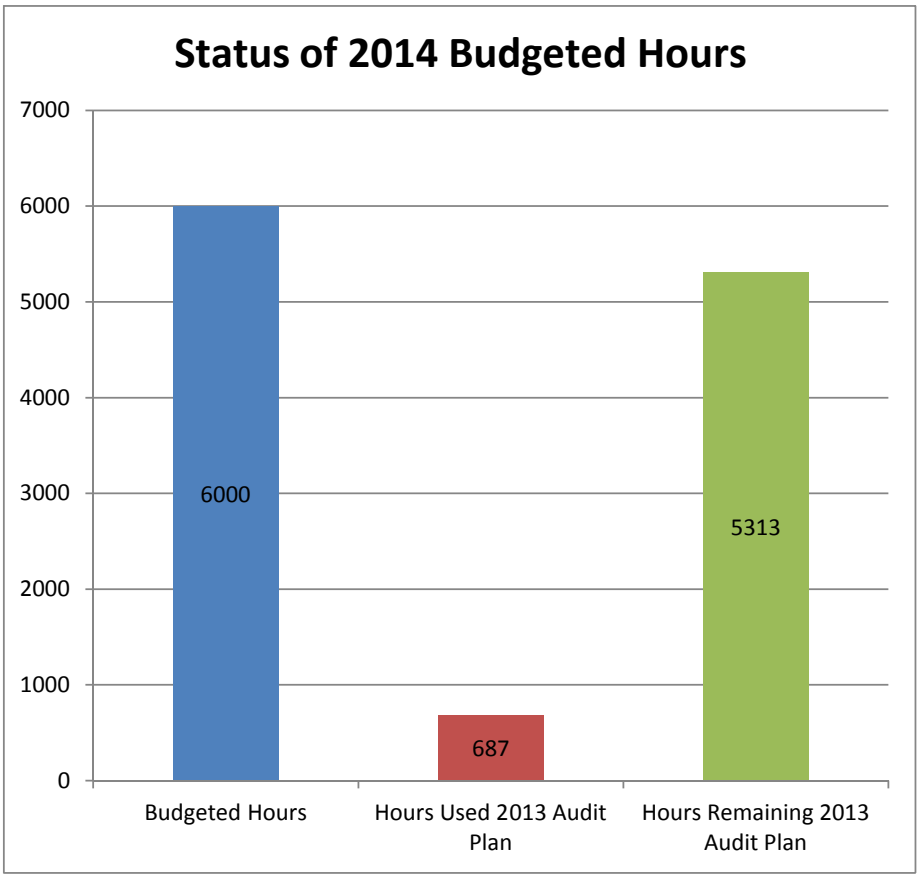
PROJECT	PLANNING / SCOPING	FIELDWORK	DRAFT REPORT	FINAL REPORT
Legal Operations				
Disposal of Assets				
Clean Rivers Project Management				
OSHA Reviews, Part 1				
Employee Benefit Plans				
Sewer Services - Distribution				
Outside Contractor Management, Part 1				
Business Continuity				
Procurement				
OSHA Reviews, Part 2				
IT – Asset Management				
GIS System				
Outside Contractor Management, Part 2				
Maintenance Services				

Warehousing & Inventory				
IT – Lawson Integration				

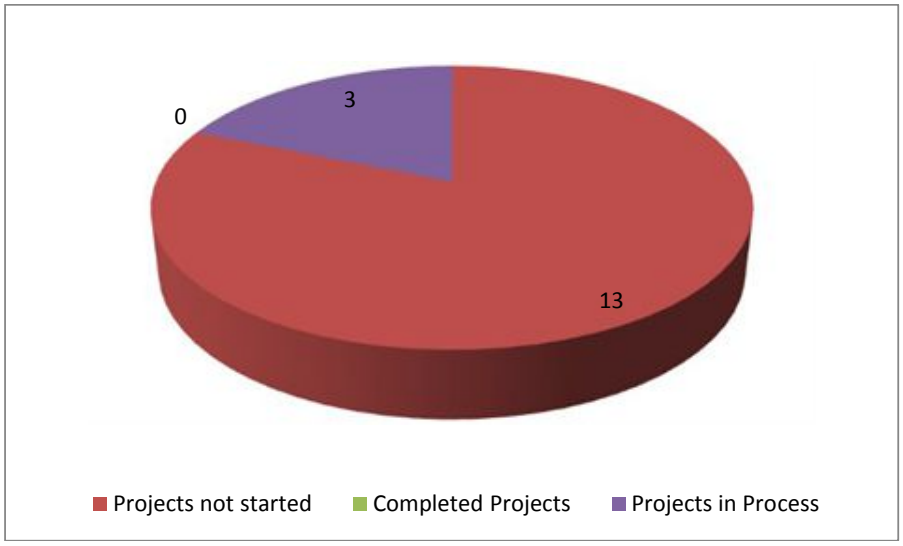
B. **Analysis of key milestone dates –** The following represents an indication of the date of completion of key project milestones.

PROJECT	START DATE	FIELD-WORK END DATE	DRAFT REPORT ISSUANCE DATE	FINAL REPORT
Legal Operations	10/14/2013			
Disposal of Assets	10/14/2013	11/20/2013		
Clean Rivers Project Management	11/13/2013			
OSHA Reviews, Part 1				
Employee Benefit Plans				
Sewer Services - Distribution				
Outside Contractor Management, Part 1				
Business Continuity				
Procurement				
OSHA Reviews, Part 2				
IT – Asset Management				
GIS System				
Outside Contractor Management, Part 2				
Maintenance Services				
Warehousing & Inventory				
IT – Lawson Integration				

C. **Analysis of Hours –** The chart below indicates the actual hours used through November 30, 2013 toward completion of the internal audit plan, along with an indication of the total hours included in the FY2014 plan.



II. 2014 Audit Plan Status



A. Reports Issued Since Last Audit Committee Meeting

1. IT SDLC & Change Management

Our overall audit objectives were to evaluate and test the effectiveness of controls relative to change management for DC Water's critical systems and to determine whether a documented Systems Development Life Cycle process/methodology is in place and operating effectively for new system implementations. Specific goals included determining if:

- Documented change management policies/procedures are in place and adequate to address the risks associated with managing routine and emergency changes to DC Water critical systems;
- Change Request Forms are used to formally document all requests and required approvals for changes to DC Water critical systems;
- System changes, as required by policies and procedures, are tested in a separate environment to a level appropriate for the risk of the change;
- Test plans, test scripts, and test results, as required, are reviewed and approved by Management and/or the Business Owner prior to the system change being moved to production;
- Appropriate segregation of duties has been considered; access to production software directories and the ability to move system changes to the production environment are restricted to only authorized, non-development IT individuals;
- System change requests are appropriately tracked and prioritized; completed system changes are verified to ensure each change moved to production meets all necessary business requirements as requested;
- A control process exists for periodically reviewing completed routine and emergency system changes to confirm compliance with change control policies and procedures, and identify any unauthorized changes to DC Water critical systems; and,
- All new system implementations during the audit period followed a formally documented and approved SDLC methodology.

Internal Audit concludes that certain components of DC Water's system change management and system development life cycle processes are in need of improvement.
In particular, there is a need to address the following:

- Enforce the IT Change Management and SDLC Policies and Procedures throughout the entire organization, and require all business units to communicate plans for new system implementations or system upgrades to the DC Water IT Department.
  - The DC Water IT Department should be responsible for the administration and governance of the system change management and system development life cycle processes;

- ❑ Establish formalized project management procedures and incorporate those into the SDLC Policy to help ensure deadlines, budgets, and system requirements are met during implementations and upgrades;
- ❑ Update the current SDLC Policy to include requirements for Quality Assurance (QA) testing and review;
- ❑ Formally review and approve the DC Water's SDLC Policy; and,
- ❑ Update the current Change Management Policy to include requirements for user acceptance testing, and post-implementation review and approvals.

This audit resulted in the addition of five Management Action Items in the chart in Section III Follow Up.

2. Telecommunications Review

Our overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities around DC Water's telecommunications services. Specific audit objectives included:

- ❑ Ensure that telecommunications usage is effectively monitored and that potential misuse is identified and restricted;
- ❑ Assess the current vendor invoice review and approval process and assure that responsibilities are adequately segregated;
- ❑ Evaluate the current usage billing review and approval process and assure that responsibilities are adequately segregated;
- ❑ Verify that telecommunications assets are properly safeguarded, and
- ❑ Ensure that DC Water maintains adequate policies and procedures and standard operating procedures around telecommunications operations.

Internal Audit concludes that the IT Department effectively monitors call data and identifies potential instances of employee abuse of telecommunications services; however, the IT Department does not effectively monitor vendor adherence to contract requirements and that vendor invoices are not properly reviewed and approved prior to payment.

Internal Audit further concludes that the current process that requires employees to reimburse DC Water for personal long distance calls is not effective or efficient. The current process for long distance usage billing is for the Telecommunications Supervisor to provide long distance billing – including call details – to the Accounts Payable Specialist, who breaks the bills out and sends them to contacts within each department on a quarterly basis. These departmental contacts then separate out the billing and distribute the call details to each employee or contractor user. The users are responsible for identifying all personal long distance phone calls and reimbursing DC Water for the cost of those personal calls. This process requires time and the efforts of several employees, and results in very minimal payback for the organization.

Internal Audit has identified several items that should be addressed by management in order to further strengthen DC Water's Telecommunications processes.

In particular, there is a need to address the following:

- Assure that all invoices are properly reviewed by the most qualified employees, and that invoice approval and payment authority is adequately restricted to the department head, or their qualified designee;
- Document a formal process for disputing invoice discrepancies with the vendors, logging the dispute into a tracking database, monitoring the status of the dispute through resolution, and closing the dispute within the database with an accurate description of the cause of the dispute and the resolution that was implemented;
- Establish and document a formal process to identify all service levels, deliverables and deadlines contained in its vendor contracts, and then implement a process to assure adherence to these contracted items on a recurring (monthly) basis. Further, contractors should be consistently charged back according to the allowances in their contracts for instances when they failed to meet the terms of their contracts;
- Establish and document a formal process to compare the number of minutes billed per the long distance usage invoice to the number of minutes per available PBX reporting to assure reasonableness;
- Increase utilization of available fraud detection reporting as the primary means of detecting employee abuse of telecommunications services, rather than relying on employee identification of personal calls and reimbursement for charges incurred for those calls;
- Establish policy and procedure documents for all processes related to telecommunications operations, and review these documents on an annual basis to assure their continued accuracy; and,
- Assure that all telecommunications assets are properly secured and that access to the assets is restricted to individuals with a legitimate business need.

This audit resulted in twelve Management Action Items. Eleven of the Management Action Items were remediated prior to the Audit Committee meeting. As such, the one remaining Management Action Item has been added to the chart in Section III Follow Up.

3. Water Services – Distribution Maintenance

Our overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities of the Distribution Maintenance Branch. Specific audit objectives included:

- Ensuring that Distribution Maintenance activities are in compliance with internal policies and procedures, as well as applicable laws and regulations;
- Determining the efficiency and effectiveness of the system capabilities surrounding Distribution Maintenance work orders;
- Ensuring Distribution Maintenance activities are operating effectively and that personnel are adequately trained; and,
- Ensuring Distribution Maintenance operates in a cost-efficient manner.

Internal Audit concludes that the Distribution Maintenance Branch effectively monitors emergency maintenance work orders and efficiently responds to reported incidents. We conclude that the internal controls surrounding the operational aspects of the Distribution Maintenance activities are effective.

Internal Audit has identified some items that should be addressed by management in order to further strengthen DC Water's Distribution Maintenance processes.

In particular, there is a need to address the following:

- Lack of real-time access to Maximo and the GIS for the field crews
- Insufficient prioritization of open work orders in the existing system
- Incomplete cost information entered into and stored in Maximo
- Incomplete management reporting for monitoring and managing key activity
- Outdated and inaccurate data is included in the system relative to Taps and Valves repairs/replacement work orders
- Incomplete information and monitoring of staff training and certification; and,
- Policies and procedures need to be created, approved and distributed to department employees and updated at least on an annual basis.

This audit resulted in the addition of seven new Management Action Items in the chart in Section III Follow Up.

4. Water Services – Distribution Control

The overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities of the Water Services - Distribution Control Branch as well as to ensure compliance with applicable laws and regulations. Specific audit objectives included:

- To ensure that the Water Services - Distribution Control Branch is in compliance with DC Water policies and procedures, as well as applicable laws and regulations;
- To ensure that proper controls exist to monitor Distribution Control Branch activities;
- To ensure that that Distribution Control Branch activities are operating effectively and efficiently, as well as to ensure that personnel are adequately trained;
- To ensure that the quality of work being performed is accurately tracked and monitored; and
- To ensure that proper safeguards exist around Distribution Control Branch assets.

Internal audit concludes that the Distribution Control Branch effectively monitors and responds to investigations (emergency and non-emergency), flushing (unidirectional and spot) and valve operations. Internal Audit concludes that the internal controls surrounding the operational aspects of the Distribution Control Branch are effective.

Internal Audit has identified some items that should be addressed by management in order to further strengthen DC Water's Water Services Distribution Control Branch processes.

In particular, there is a need to address the following:

- Inconsistent methodology to track and identify valves in the water distribution system;
- Lack of automation in the Valve Exercising KPI calculations; and
- Insufficient reporting out of Maximo to analyze crew efficiency.

This audit resulted in three Management Action Items. However, two of these items were addressed prior to the Audit Committee meeting; therefore one item has been included in the chart in Section III Follow Up.

III. Follow Up

In addition to our work performed relative to the audit projects identified in the FY2013 and FY2014 Internal Audit Plans, Internal Audit conducted follow-up activity relative to previously reported audit comments. The table below summarizes the issues by area of responsibility and the current status of the action plan proposed by Management.

	Chief Engineer	AGM Blue Plains	AGM Consumer Services	Chief Financial Officer	General Counsel	Chief Information Officer	AGM Support Services	General Manager	Total
New Management Action Plans Since Previous Meeting	-	-	8	1	-	5	-	-	14
Management Action Plans Implementation Date Not Expired	-	13	6	2	-	7	13	-	41
Management Action Plans Implementation Date Expired	-	-	-	-	-	-	1	-	1
Total	-	13	14	3	-	12	14	-	56

Listed Below are the Details of the Management Action Plans with Expired Implementation Dates

AGM Support Services

1. 2012 Warehouse Operations – Formalized procedures have not been implemented to proactively monitor specialized storage requirements of the effects of environmental changes on inventory.

IV. Other Topics

Policy Document Approvals

Internal Audit continues to monitor the remediation of the process to review and approve revised DC Water Policy and Procedure documents by the General Manager prior to being made available to all DC Water employees.

Fraud Hotline

To date, a total of 11 allegations have been received as a result of the Fraud, Waste and Abuse hotline. One of the 11 reports has been received since the September 26 Audit Committee meeting. Ten of the 11 reports have been investigated and closed.

Asset Inventory

At the request of the Finance department, Internal Audit was asked to assist in the validation the work performed by the IT and Fleet departments to locate assets that were identified as "missing" by the inventory vendor who performed the initial and follow-up asset inventory counts. As the departments located the outstanding assets, Internal Audit performed subsequent inspections to confirm the location of each asset and to assure that they were properly tagged and recorded onto the inventory listing. Internal Audit utilized approximately 130 of the hours designated for "Management Requests & Special Projects" towards this effort.

Telecommunications Review

Internal Audit Report

October 14, 2013

INTERNAL AUDIT TEAM

Director:	Joe Freiburger
Manager:	Russell Ojers
Associate:	Dominic Usher

DC Water – 2013 Internal Audit
Telecommunications Review

SC&H GROUP, LLC

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EXECUTIVE SUMMARY

Background

DC Water's telecommunications services are managed and operated by the organization's Information Technology ("IT") department. Telecommunications hardware, software and peripheral services, such as call network monitoring, are procured for each of DC Water's locations using public utility providers and specialized contractors. The telecommunications systems and processes are managed by DC Water employees and by contracted personnel.

During FY2013, the DC Water IT department spent approximately $1.8 Million on local and long distance telephone service, voicemail and internet service for over 1,000 users. Additionally, DC Water expended approximately $665 thousand on telecommunications-related vendors – including both operational spending such as professional staffing services and system maintenance, and capital spending such as upgrades to voicemail services and new desktop sets.

Objectives

Our overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities around DC Water's telecommunications services. Specific audit objectives included:

- ❑ Ensure that telecommunications usage is effectively monitored and that potential misuse is identified and restricted;
- ❑ Assess the current vendor invoice review and approval process and assure that responsibilities are adequately segregated;
- ❑ Evaluate the current usage billing review and approval process and assure that responsibilities are adequately segregated;
- ❑ Verify that telecommunications assets are properly safeguarded, and
- ❑ Ensure that DC Water maintains adequate policies and procedures and standard operating procedures around telecommunications operations.

Audit Scope and Procedures

This audit was conducted based on the approved FY2013 internal audit plan. The audit was initiated in August, 2013 and completed in September, 2013. The audit included an evaluation of the processes and procedures of the IT Department around vendor management and the monitoring of long distance usage and also the Finance department, as it pertains to the processing of long distance invoices. The audit process included interviews with appropriate members of the IT and Finance department, and also personnel within other departments, where applicable.

The audit process also included data analysis and the substantive testing of a sample of call monitoring metrics, vendor invoices and long distance usage bills. Emphasis was placed on the identification of risks that could adversely affect the telecommunications services provided to DC Water, and the efficient performance of telecommunications-related activities.

Summary of Work

Internal Audit concludes that the IT Department effectively monitors call data and identifies potential instances of employee abuse of telecommunications services; however, the IT Department does not effectively monitor vendor adherence to contract requirements and that vendor invoices are not properly reviewed and approved prior to payment.

Internal Audit further concludes that the current process that requires employees to reimburse DC Water for personal long distance calls is not effective or efficient. The current process for long distance usage billing is for the Telecommunications Supervisor to provide long distance billing – including call details – to the Accounts Payable Specialist, who breaks the bills out and sends them to contacts within each department on a quarterly basis. These departmental contacts then separate out the billing and distribute the call details to each employee or contractor user. The users are responsible for identifying all personal long distance phone calls and reimbursing DC Water for the cost of those personal calls. This process requires time and the efforts of several employees, and results in very minimal payback for the organization.

Internal Audit has identified several items that should be addressed by management in order to further strengthen DC Water's Telecommunications processes.

In particular, there is a need to address the following:

- Assure that all invoices are properly reviewed by the most qualified employees, and that invoice approval and payment authority is adequately restricted to the department head, or their qualified designee;
- Document a formal process for disputing invoice discrepancies with the vendors, logging the dispute into a tracking database, monitoring the status of the dispute through resolution, and closing the dispute within the database with an accurate description of the cause of the dispute and the resolution that was implemented;
- Establish and document a formal process to identify all service levels, deliverables and deadlines contained in its vendor contracts, and then implement a process to assure adherence to these contracted items on a recurring (monthly) basis. Further, contractors should be consistently charged back according to the allowances in their contracts for instances when they failed to meet the terms of their contracts;

- Establish and document a formal process to compare the number of minutes billed per the long distance usage invoice to the number of minutes per available PBX reporting to assure reasonableness;
- Increase utilization of available fraud detection reporting as the primary means of detecting employee abuse of telecommunications services, rather than relying on employee identification of personal calls and reimbursement for charges incurred for those calls;
- Establish policy and procedure documents for all processes related to telecommunications operations, and review these documents on an annual basis to assure their continued accuracy; and,
- Assure that all telecommunications assets are properly secured and that access to the assets is restricted to individuals with a legitimate business need.

SC&H Consulting

By:

_____

Joe Freiburger, CPA, CIA

II. DETAILED OBSERVATIONS & RECOMMENDATIONS

I. The Current Vendor Invoice Review and Approval Process		
Observation: Telecommunications vendor invoices are not properly reviewed and approved prior to payment on a consistent basis. Internal Audit noted that some invoice types – such as "Professional Services" are automatically approved when they are entered into PORTS by the IT Administrative Assistant. In these instances, no other invoice reviews or approvals are required. Internal Audit further noted that the IT Administrative Assistant has "Department Head" access to approve invoices in Lawson without additional review or approval. Note: Internal Audit received confirmation that on August 23, 2013 the Lawson profile for the IT Administrative Assistant was changed from "Releaser" to "Requestor". The CIO has "Releaser" access in Lawson, as does the IT Manager.	**Recommendation:** Internal Audit recommends that IT remediate its invoice review and approval process to assure that all invoices are properly reviewed by the most qualified employees, and that invoice approval and payment authority is adequately restricted to the department head, or their qualified designee.	**Management's Action Plan:** On August 20, the Information Technology Department Chief Information Officer remediated the invoice review process by modifying Lawson approval access to make the CIO the primary approver on all professional services and IT procurements, with the IT Manager as the back-up approver. **Implementation Date:** This action item was remediated on August 20, 2013. Note: Internal Audit verified with the Finance department that the approvals have been changed to reflect the above approvers.

Risk: Without an appropriate invoice review and approval process, it is possible that vendors could submit inaccurate invoices that could be processed and paid by DC Water without the errors being identified or corrected.		
Observation: A formal process has not been defined and documented for disputing discrepancies with telecommunications vendor invoices. Further, there is not a mechanism for tracking and monitoring open vendor disputes, or reporting on the success or failure of resolved disputes. **Risk:** Without a formal process to dispute vendor discrepancies with vendors, DC Water could fail to correct billing errors. Vendor disputes, as well as their outcomes, should be tracked and monitored to assure that all disputes are resolved, and that any trends or recurring causes could be identified and resolved with the vendor.	**Recommendation:** Internal Audit recommends that IT document a formal process for disputing invoice discrepancies with the vendors, logging the dispute into a tracking database, monitoring the status of the dispute through resolution, and closing the dispute within the database with an accurate description of the cause of the dispute and the resolution that was implemented.	**Management's Action Plan:** The Telecommunication Department will remediate the vendor discrepancies with vendors in two approaches: • The Telecommunication Department will open an Information Technology Solution Center (ITSC) ticket whenever there is an issue reported with telecommunication services; and, • The Telecommunication Department will run a report using ITSC ticket database to see if the vendor met their service level agreement per their contract with DC Water. The telecom team will review all telecom services contract to ensure that we have a baseline to manage missed SLA's by the vendor. **Implementation Date:** The Information Technology Department will implement action plan in November 1, 2013.

Observation: There is not currently a process in place to monitor vendor adherence to contracted service levels or timeliness of service delivery. **Risk:** Without a process in place to monitor vendor adherence to the terms of their contracts with DC Water, vendors could be paid for items that they have not provided, service levels that they have not delivered, or deadlines that were not met.	**Recommendation:** Internal Audit recommends that IT establish and document a formal process to identify all service levels, deliverables and deadlines contained in its vendor contracts, and then implement a process to assure adherence to these contracted items on a recurring (monthly) basis. Further, contractors should be consistently charged back according to the allowances in their contracts for instances when they failed to meet the terms of their contracts.	**Management's Action Plan:** The Telecommunication Department will remediate the vendor discrepancies with vendors in two approaches: • All telecommunication services will be monitored by information technology tools to check the performance to validate the contract agreement in place to manage performance issue; and, • Information Technology will develop a performance matrix document to manage issues that are found to be true per the Information technology tools. This performance matrix tool will be reviewed each month for performance issues and the matrix document will be use to communicate the issue with DC Water's service provider. **Implementation Date:** The Information Technology Department will implement action plan in November 1, 2013.

II. The Current Usage Billing Review and Approval Process		
Observation: Internal Audit noted that there is no reconciliation performed to compare the number of long distance minutes per the usage invoices to the number of long distance minutes captured per the PBX system in order to validate the accuracy of the long distance bills. Further, there is not currently a process in place to assure that invoiced per-minute long distance rates agree to contracted terms. **Risk:** Without an appropriate usage invoice reconciliation, it is possible that the long distance vendor could submit inaccurate invoices that could be processed and paid by DC Water without the errors being identified or corrected.	**Recommendation:** Internal Audit recommends that IT establish and document a formal process to compare the number of minutes billed per the long distance usage invoice to the number of minutes per available PBX reporting to assure reasonableness.	**Management's Action Plan:** Telecommunication Department will remediate the long distance reconciliation by installation of a Securelogix long distance configuration change to validate long distance usage. DC Water management will review the long distance reports against the usage report, to ensure accurate billing. **Implementation Date:** Information Technology Department will implement action plan in November 1, 2013
Observation: The amount of labor required to identify personal long distance telephone calls is not justified by the total amount of reimbursements received each period.	**Recommendation:** We recommend reliance on available fraud detection reporting to mitigate the risk of misuse of DC Water long distance telephone services.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. The current process is not cost effective and should be discontinued and replaced with the automated fraud detection reporting administered by Information

Internal Audit received documentation from the Accounts Payable Specialist that identifies total long distance bill amounts for 1Q13 in the amount of $1,066.25. Further, the information notes total employee reimbursement for personal calls in the amount of $41.67. Additionally, Internal Audit received documentation from the Accounts Payable Specialist that identifies total long distance bill amounts for 2Q13 in the amount of $1,032.36. Further, the information notes total employee reimbursement for personal calls in the amount of $46.06. There are a lot of people involved in this review process – the Accounts Payable Specialist, 28 departmental contacts, all of the affected employees and the Treasury representative who prepares the deposit. All of these people take their time for this process, rather than their assigned responsibilities, for an average of $12 per month that is collected across DC Water for personal long distance telephone calls.	This reporting uses a set of automated logic to identify the users that place the longest calls and place calls to locations that are not related to DC Water services or vendors. The implementation of this review, rather than the current manual long distance bill review process, assures that abuses are detected, but also that employee productivity is not negatively impacted by this process each month.	Technology Department (IT). IT will routinely report results of fraud detection reporting to Controller's office. **Implementation Date:** November 30, 2013

Risk: DC Water experiences a loss of productivity among all of the individuals involved in the process to distribute long distance bills to all employees, identify personal long distance telephone calls, collect payment, transfer signed long distance cover sheets and associated monies to the Accounting Clerk and deposit collected monies into a DC Water account.		
Observation: The process used to identify personal long distance telephone calls relies on employees to self-identify their long distance calls that were personal, rather than DC Water-related business. If the employee does not identify a call as a personal call, there is not a process to validate this assertion and therefore no reimbursement is obtained. **Risk:** There's an inherent lack of completeness and accuracy in a process that relies on self-reporting. Personal calls may not be accurately identified in each instance; therefore the associated reimbursement may not be received by DC Water.	**Recommendation:** We recommend the design and implementation of a process to assure that all personal long distance telephone calls are properly identified.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. The current process is not reliable or accurate and should be discontinued and replaced with the automated fraud detection reporting administered by Information Technology Department (IT). IT will routinely report results of fraud detection reporting to Controller's office. **Implementation Date:** November 30, 2013

Observation: There is no process in place for the Accounting Clerk to assure that all employees return their long distance bills, along with reimbursement for any personal long distance calls. Other than identifying user long distance bills that are for the highest dollar amounts and remembering to look for them, the Accounts Payable Specialist does not track all user bills to make sure they are returned. **Risk:** It is possible that some employees do not return their long distance bills and, as such, do not reimburse DC Water for personal long distance telephone calls.	**Recommendation:** We recommend the design and implementation of a process to assure that employee long distance bills are reviewed, acknowledged and returned by each employee each period.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. The current process is not effective and should be discontinued and replaced with the automated fraud detection reporting administered by Information Technology Department (IT). IT should routinely report results of fraud detection reporting to Controller's office. **Implementation Date:** November 30, 2013
Observation: Employees do not receive receipts for monies paid to DC Water as reimbursement for personal long distance phone calls. **Risk:** Misappropriation of assets. There is not a control in place to assure that all monies received from employees as reimbursement for personal long distance telephone calls is properly recorded and deposited.	**Recommendation:** Accounting should provide receipts to employees in each instance in which they make payment to DC Water as reimbursement for personal long distance telephone calls.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. Accounts Payable Specialist will issue receipts to employees when they make payments for long distance calls. A standard receipt book will be used to register the payments, cash held in the safe, reconciled to receipts and deposited on a periodic basis. **Implementation Date:** November 30, 2013

Observation: Monies received as reimbursement from employees/contractors for personal long distance telephone calls are not independently counted or verified to assure completeness and accuracy. **Risk:** Misappropriation of assets. There is not a control in place to assure that all monies received from employees as reimbursement for personal long distance telephone calls is properly recorded and deposited.	**Recommendation:** We recommend the design and implementation of a process to assure that all monies received from employees as reimbursement for personal long distance telephone calls are dual-verified prior to deposit.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. Accounts Payable Specialist will issue receipts, hold cash in the safe and reconcile to receipts with accompanying review by Controller prior to deposit on a quarterly basis. **Implementation Date:** November 30, 2013
III. Policies and Procedures are Not Adequately Maintained		
Observation: There are no policies and procedures documents pertaining to the management and operation of DC Water's telecommunications services. **Risk:** Failing to establish and maintain accurate policy and procedure documentation could allow for inconsistent practices, failure to identify and implement procedural changes, and could disrupt operations in the event of turnover within key positions.	**Recommendation:** Internal Audit recommends that IT establish policy and procedure documents for all processes related to telecommunications operations, and that these documents be reviewed on an annual basis to assure their continued accuracy.	**Management's Action Plan:** Management agrees with this finding. **Implementation Date:** The Information Technology Department will Implement all processes related to SOP's and policies by December 15, 2013.

Observation: Internal Audit obtained a document titled "Accounting Policy And Procedure Manual – Volume III – Chapter 6: Procurement/ Disbursements Cycle". The document provides a general overview of the process to disseminate long distance bills to departments and users for review and identification of personal calls. The document also describes the process to photocopy checks and forward them to Treasury for deposit. The document does not specify the process to be followed when cash is received as payment for personal long distance telephone calls. Internal Audit also noted that the effective date of this document is 9/15/2009. **Risk:** Failing to update and maintain accurate policy and procedure documentation could allow for inconsistent practices, failure to identify and implement procedural changes, and could disrupt operations in the event of turnover within key positions. Further, a failure to identify all current processes could overlook controls needed to prevent the misappropriation of cash received as payment for personal long distance telephone calls.	**Recommendation:** Internal Audit recommends that Finance assure that the policy and procedure documentation related to long distance billing is reviewed and updated on an annual basis to assure its continued accuracy.	**Management's Action Plan:** OCFO Response: Management agrees with the recommendation. The policy and procedure documentation is currently being revised and updated. **Implementation Date:** November 30, 2013

IV. Safeguarding of Telecommunications Assets		
Observation: Excess Alcatel-Lucent desktop sets are not adequately safeguarded. Internal Audit visually inspected a supply closet containing excess Alcatel-Lucent desktop sets on 8/21 @ 4PM, on 8/22 @ 2:30PM and on 9/3 @ 11:45AM. In each instance, Internal Audit found the supply closet door to be open. Additionally, Internal Audit found that the back door to the IT building (in very close proximity to the supply closet) was also open. **Risk:** Misappropriation of assets. The supply of excess Alcatel-Lucent desktop sets maintained in the IT closet are vulnerable for theft, since the back door is left open, and the closet where the desktop sets is also left open.	**Recommendation:** Assure that all telecommunications assets are properly secured and that access to the assets is restricted to individuals with a legitimate business need. In this case, either make sure that the closet door remains closed and locked at all times (preferably the back door as well), or ascertain a better, more secure location for the storage of excess desktop sets.	**Management's Action Plan:** Information Technology opened a work order with the Facilities Department and had the lock repaired for the rear door and was fixed. Information Technology has relocated all Alcatel-Lucent desktop sets in the Information Technology supply room that is secured with a lock. **Implementation Date:** This action item was remediated on September 17, 2013. Note: Internal Audit physically verified that the Alcatel-Lucent desktop sets have been relocated to a locked closet. The IT Administrative Assistant is responsible for the key to the closet door. Anyone requiring access to the closet must obtain the key from the IT Administrative Assistant.

System Development Life Cycle and System Change Management

Internal Audit Report

October 21, 2013

INTERNAL AUDIT TEAM

Manager:	Anthony DiGiulian
Principal:	Scott Heflin
Director:	Joe Freiburger

DC Water – 2013 Internal Audit
SDLC and System Change Management

SC&H GROUP, LLC

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EXECUTIVE SUMMARY

Background

As a major utility company, DC Water is dependent on information technology to support critical mission and business processes. The Authority has been increasingly applying information technology in an operational capacity as a business enabler to reduce costs and increase efficiency. In addition to supporting day-to-day operations from multiple computer systems, platforms and applications, the DC Water IT Department has been deploying commercial off-the-shelf (COTS) technology to reduce complexity, eliminate dependencies on proprietary technology, and increase the efficiency of support operations; deploying communications technologies to connect geographically dispersed or remote locations; and enabling mobile computing and remote telecommuting to support off-site access.

The increasing dependency on information assets (systems and data) has created many potential risks that must be managed appropriately to ensure efficient and effective operations. Establishing a System Development Life Cycle (SDLC) methodology to ensure successful implementations of new systems and an effective process for managing changes to existing systems is a key component in mitigating these risks. It ensures that system development and system changes are controlled and monitored, and that DC Water's information systems continue to operate correctly and as intended throughout their life cycle.

Objectives

Our overall audit objectives were to evaluate and test the effectiveness of controls relative to change management for DC Water's critical systems and to determine whether a documented Systems Development Life Cycle process/methodology is in place and operating effectively for new system implementations. Specific goals included determining if:

- Documented change management policies/procedures are in place and adequate to address the risks associated with managing routine and emergency changes to DC Water critical systems
- Change Request Forms are used to formally document all requests and required approvals for changes to DC Water critical systems
- System changes, as required by policies and procedures, are tested in a separate environment to a level appropriate for the risk of the change

- ❑ Test plans, test scripts, and test results, as required, are reviewed and approved by Management and/or the Business Owner prior to the system change being moved to production
- ❑ Appropriate segregation of duties has been considered; access to production software directories and the ability to move system changes to the production environment are restricted to only authorized, non-development IT individuals
- ❑ System change requests are appropriately tracked and prioritized; completed system changes are verified to ensure each change moved to production meets all necessary business requirements as requested
- ❑ A control process exists for periodically reviewing completed routine and emergency system changes to confirm compliance with change control policies and procedures, and identify any unauthorized changes to DC Water critical systems
- ❑ All new system implementations during the audit period followed a formally documented and approved SDLC methodology

Audit Scope and Procedures

This audit was conducted in accordance with the approved 2013 internal audit plan. The audit was initiated in July 2013 and completed in September 2013. The audit included a review of the DC Water System Development Life Cycle methodology and the process for managing system changes during the period of July 1, 2012 through July 5, 2013. Internal Audit met with management and key members of the Information Technology Department to identify DC Water systems that are deemed critical to daily operations. Through interviews with management and review of documented policies, Internal Audit chose to include the following DC Water critical systems in the scope of this audit:

- ➢ Geographic Information System (GIS)
- ➢ Asset Management System (Maximo)
- ➢ DC Water Financial System (Lawson)
- ➢ Enterprise Document Management System (Livelink)

There were a total of 24 routine changes applied to the systems in scope during the audit period. Internal Audit included 100% of the population of changes in our review.

Summary of Work

Internal Audit concludes that certain components of DC Water's system change management and system development life cycle processes are in need of improvement.

In particular, there is a need to address the following:

- Enforce the IT Change Management and SDLC Policies and Procedures throughout the entire organization, and require all business units to communicate plans for new system implementations or system upgrades to the DC Water IT Department.
  - The DC Water IT Department should be responsible for the administration and governance of the system change management and system development life cycle processes
- Establish formalized project management procedures and incorporate those into the SDLC Policy to help ensure deadlines, budgets, and system requirements are met during implementations and upgrades
- Update the current SDLC Policy to include requirements for Quality Assurance (QA) testing and review
- Formally review and approve the DC Water's SDLC Policy
- Update the current Change Management Policy to include requirements for user acceptance testing, and post-implementation review and approvals

SC&H Consulting

By:

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Joe Freiburger, CPA, CIA

II. DETAILED OBSERVATIONS & RECOMMENDATIONS

I. System Implementations		
Observation: DC Water's current system implementation process allows for individual business units to implement new systems and manage system changes independently of the DC Water SDLC and IT Change Management policies and procedures. Furthermore, not all new system implementations and system changes are communicated to and involve the DC Water IT Department. **Risk:** Inconsistent adherence to SDLC and Change Management policies and procedures, coupled with a lack of communication with DC Water's IT Department, can lead to an incomplete inventory of systems, increased security risks, and inefficient handling of system maintenance.	**Recommendation:** Management should require adherence to DC Water SDLC and IT Change Management Policies and Procedures throughout the entire organization, and formalize requirements for communicating any plans for new system implementations or system upgrades to the DC Water IT Department. Project Management drives strategic vision, project value, and execution. Project Management procedures reduce the risk that implementations and system upgrades fail to meet deadlines, budgets, and customer and stakeholder satisfaction. Management should establish formalized Project Management procedures and incorporate those into the SDLC process.	**Management's Action Plan:** IT agrees with the assessment from Internal Audit. As a best practice SDLC and Change Management works best as a standard through all departments with one organization handling the administration and governance of the process. A unified system and process is easier to manage and benefits all of DC Water. Create and Implement IT Governance Model **Implementation Date:** January 31, 2014

II. Quality Assurance Testing		
Observation: The SDLC Policy does not include a requirement for Quality Assurance (QA) testing. **Risk:** QA testing is a process which assists in the assurance that completed project development satisfies contractual agreements, meets or exceeds quality standards, and complies with approved SDLC processes. By not including QA testing requirements within the SDLC Policy, there is an increased risk that completed projects will not meet business and user expectations.	**Recommendation:** Management should establish and incorporate formalized QA testing requirements into the SDLC process.	**Management's Action Plan:** 1) Acquire and setup a Quality Assurance system to support functional and performance testing 2) Add QA Resources to install, configure, administer and monitor the QA process and system for DC Water 3) Document the QA process for DC Water 4) Update the SDLC incorporating QA **Implementation Date:** December 31, 2013

III. Outdated SDLC Policy and Procedures		
Observation: All three of the SDLC Policies inspected during the audit had not been updated or formally reviewed and approved since 2006. **Risk:** The absence of a formalized review and approval of DC Water's SDLC Policy increases the likelihood that the document may not be representative of the current SDLC processes, thus leading to noncompliant performance.	**Recommendation:** Management should update, formally review, and approve the most recent SDLC Policies. Furthermore, Management should then ensure the updated and approved SDLC Policies are communicated and made available to DC Water personnel.	**Management's Action Plan:** 1) Update SDLC document 2) Obtain necessary approvals 3) Communicate to Business community and post on Intranet/Departmental site **Implementation Date:** November 29, 2013

IV. Post Implementation Review and Approval		
Observation: DC Water's current Change Management process does not require post implementation review and approval. Furthermore, the DC Water Change Management system does not track completion of changes to verify successful implementation. **Risk:** Not requiring post implementation review and approval increases the risk that changes are moved into production which may not satisfy user requirements. By not tracking completion of changes, DC Water increases the risk that approved changes are not successfully implemented into production.	**Recommendation:** Internal Audit recommends that DC Water require post implementation review and approval within the Change Management system. For additional comfort over the completion of approved changes, we recommend that DC Water consider performing periodic (quarterly or semi-annually) review of all changes to key IT systems.	**Management's Action Plan:** 1) Incorporate Post-Implementation review into Change Management Policy document 2) Implement Post Implementation Review and Approval into online Change Management System 3) We will spot check. Our main concern is that the proper communication is provided to IT regarding changes and verification. **Implementation Date:** December 15, 2013

V. Business Testing and Approval		
Observation: DC Water's Change Management process does not require user acceptance testing, implementation planning, impact analysis, or formal approval from business owners for those changes which affect business processes. **Risk:** By not requiring business owner involvement in user acceptance testing, implementation planning, and impact analysis, there is an increased risk that changes affecting business processes may not meet intended user requirements. Additionally, there's increased risk that the changes could adversely affect the production of the system.	**Recommendation:** Management should develop requirements for user acceptance testing from business owners prior to implementation of changes into production. Management should ensure the user acceptance testing and other business requirements are incorporated into the Change Management Policy and procedures.	**Management's Action Plan:** 1) Meet with Business Owners to gather user acceptance, impact analysis and implementation planning requirements as it pertains to change management 2) Update change management approval workflow to accommodate business requirements 3) Update Change Management system to incorporate business requirements **Implementation Date:** December 15, 2013

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Water Services - Distribution Maintenance Branch

Internal Audit Report

October 28, 2013

INTERNAL AUDIT TEAM

Director: Joe Freiburger

Manager: Rebecca Jordan

DC Water – 2013 Internal Audit
Distribution and Conveyance - Distribution Maintenance Branch

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EXECUTIVE SUMMARY

Background

DC Water's Water Services department operates one of the oldest water systems in the United States, which began operating in the early 1800's. DC Water's service area is approximately 725 square miles and its water distribution systems consists of 1,300 miles of water pipes, five pumping stations, five reservoirs, three water towers, 46,000 valves, 9,400 fire hydrants, and over 130,000 service connections. DC Water has committed to updating its water distribution system by replacing at least 1% of the out-of-date piping and infrastructure each year. Within the department, there are six groups that work together to operate and maintain a potable water transmission and distribution system, which delivers safe drinking water to DC residents. These groups are:

- Drinking Water;
- Pumping Operations (Note: this will be moved to a new department; "Pumping Distribution and Conveyance" under during FY2014);
- Distribution Control Branch;
- Distribution Maintenance Branch;
- Fire Hydrants; and
- Technical Support Services.

The focus of this review is the Distribution Maintenance Branch (DMB), which is responsible for the repair and maintenance of the water distribution system. Recently, an outside consultant was hired to assess the current processing and workflow and provide recommendations on how to improve the department's efficiency and effectiveness in responding to customer complaints by providing updated workflow mapping to increase automation.

The Distribution Maintenance Branch provides the routine and emergency maintenance function for all water distribution-related problems in the District of Columbia. Additionally, they are available to assist with capital improvement-related repairs, if necessary. The Distribution Maintenance Branch works closely with other departments such as Customer Service, which is responsible for receiving the customer complaints and dispatching crews, and Engineering and Technical Services, who develop long-term solutions to infrastructure or recurring problems identified by emergency maintenance crews; as well as the various other departments. While the department must comply with multiple EPA and Drinking Water laws and regulations, these regulatory requirements are monitored by the Drinking Water branch and therefore were not included in the scope of this review.

Jason Hughes, Manager of Distribution Maintenance Branch, is responsible for the repairs, maintenance and replacement, if necessary, of all buried assets including water mains, service lines, valves, and taps. The Distribution Maintenance Branch also repairs and replaces some above ground assets such as meters, manholes, and fire hydrants when necessary.

Mr. Hughes currently has a staff of approximately 50 employees that includes a general foreman, three foremen, lead workers, repairs and maintenance workers and equipment operators. Each of the three foreman are responsible for two or three crews (total of eight crews), as well as three equipment operators each, who are responsible for the repairs and maintenance of DC Water's infrastructure. Additionally, the foremen utilize an on-call construction contractor to supplement their workload requirements.

From October 1, 2012 through September 14, 2013, the Distribution Maintenance Branch has completed approximately 1,500 maintenance work orders, while the on-call contractor has completed approximately 350 work orders. Calls come in through the Command Center (under Customer Service) and are routed to the Distribution Control Branch, who is responsible for the immediate investigation of the issue. The Distribution Control Branch will dispatch a crew to the field to gather more information about the issue including the exact location as well as trying to determine the root cause of the issue. The Distribution Control Investigation crews cannot perform any repair and maintenance work; however, they can operate the valves to immediately address an issue, if necessary. Once the investigation is complete, the updated information is entered into the work order and the initial "Investigation" work order is closed in Maximo. A subsequent, related "Emergency" work order is created and routed to the Distribution Maintenance Branch. True emergency work orders, such as water main breaks or severe service disruptions, will be handled first and the crews spend the remainder of their time working on other open work orders, known as the backlog, as available.

During Mr. Hughes' tenure at DC Water, he has implemented changes to help decrease the current backlog of open work orders in Maximo. He has implemented a program that holds his crews accountable for completing two work orders per day, five days per week. Each crew's performance is tracked on a weekly basis and charts are displayed in common areas so that the crews can see how they are performing in comparison to departmental goals. Since September 15, 2010, the backlog of open emergency work orders has decreased from over 1,000 to approximately 140 (as of September 15, 2013). Further, Mr. Hughes has worked to increase communication between departments to prioritize work orders in a more efficient manner to ensure the most critical work orders are resolved timely and that work orders affecting service or billing are handled within a reasonable amount of time to increase customer satisfaction. Additionally, Mr. Hughes has championed the increased use of Maximo including the upcoming integration of materials issuances into the Maximo work orders, which will allow for better inventory control, job costing and increased efficiency of operations. This change is expected to begin in January 2014.

Objectives

Our overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities of the Distribution Maintenance Branch. Specific audit objectives included:

- Ensuring that Distribution Maintenance activities are in compliance with internal policies and procedures, as well as applicable laws and regulations;
- Determining the efficiency and effectiveness of the system capabilities surrounding Distribution Maintenance work orders;
- Ensuring Distribution Maintenance activities are operating effectively and that personnel are adequately trained; and,
- Ensuring Distribution Maintenance operates in a cost-efficient manner.

Audit Scope and Procedures

This audit was conducted based on the approved FY2013 internal audit plan. The audit was initiated in June, 2013 and completed in September, 2013. It included an evaluation of the physical controls, as well as the processes and procedures of the Distribution Maintenance Branch and other DC Water departments, where applicable, as they pertain to the repairs and maintenance of the water distribution system. The audit process included interviews with appropriate members of the Distribution Maintenance and Distribution Control Branches, Customer Service and Human Capital Management personnel. The audit process also included data analysis and the substantive testing of a sample of emergency work orders, performance metrics, quality control of emergency maintenance jobs, and employee training. Emphasis was placed on the identification of risks that could adversely affect Distribution Maintenance Branch and the efficient performance of these activities.

Summary of Work

Internal Audit concludes that the Distribution Maintenance Branch effectively monitors emergency maintenance work orders and efficiently responds to reported incidents. We conclude that the internal controls surrounding the operational aspects of the Distribution Maintenance activities are effective.

Internal Audit has identified some items that should be addressed by management in order to further strengthen DC Water's Distribution Maintenance processes.

In particular, there is a need to address the following:

- Lack of real-time access to Maximo and the GIS for the field crews
- Insufficient prioritization of open work orders in the existing system
- Incomplete cost information entered into and stored in Maximo
- Incomplete management reporting for monitoring and managing key activity
- Outdated and inaccurate data is included in the system relative to Taps and Valves repairs/replacement work orders
- Incomplete information and monitoring of staff training and certification; and,
- Policies and procedures need to be created, approved and distributed to department employees and updated at least on an annual basis.

SC&H Consulting

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II. DETAILED OBSERVATIONS & RECOMMENDATIONS

I. Remote Access to Maximo for Field Crews		
Observation: The Distribution Maintenance Branch emergency crews do not have laptops or tablets. This hinders their ability to have real-time access to Maximo or GIS, which means they must call their supervisors or the Command Center for current information. Further, field crews have to manually fill out multiple forms in the field, including the Daily Field Reports, and subsequently enter information from those forms into Maximo, resulting in a duplication of efforts. Additionally, they are required to scan the Daily Field Reports, and all other relevant documentation into Maximo. **Risk:** Failure to utilize automation and technology could result in increased response time, increased overtime hours, and further disruption of customers' water services.	**Recommendation:** We recommend that Management consider providing field crews with laptops or tablets in the field so that field crews can have real-time access to Maximo and GIS. This will allow the crews to be better equipped to perform their duties efficiently and effectively. Further, this would eliminate the need for crew members to fill out paper forms reducing redundancies. Utilizing further automation will reduce response time and customer's disruption of services as crews will be able to improve their workflow and require reduced communication back and forth between field crews and their supervisors or command center to complete open work orders.	**Management's Action Plan:** We will follow the recommendations outlined and engage the Information Technology (IT) department to identify mobile devices (hardware and software) that will support the operational needs as defined by DMB. After identification of the mobile devices, we will begin a short pilot to where its use in our process will be evaluated on a daily basis by the users. Usage data will be collected and used to assist in identification of the appropriate tool and corresponding software required to maintain and improve operational efficiencies. Fleet Services will also need to participate in this pilot to ensure adequate support for use in the field. **Implementation Date:** Hardware/Software Identification [Jan 2014] Pilot Funding & Implementation [Apr 2014] System Section [May 2014] Funding & Complete Implementation [Oct 2014]

II. Prioritization of Open Work Orders		
Observation: Our review indicated that lower priority items may be resolved before high priority items because there is there is no effective prioritization of items as orders are received. Additionally, open work orders on the back log are identified by priority. **Risk:** Without properly prioritizing work orders, existing and new, there is a risk that response time to customer issues is both ineffective and inefficient which could negatively impact the customer's experience with DC Water and DC Water's reputation to the public.	**Recommendation:** Distribution Maintenance Branch should work with Distribution Control Branch and Customer Services (Command Center) to ensure all work orders are properly prioritized within Maximo. Further, prioritization needs to documented and defined by the required turn-around time. For example, water service disruptions should be addressed within 24 hours, whereas issues affecting customer billing should be addressed within 30 days or one billing period. Further, issues of equal priority should be resolved on an aged basis (first come, first serve). By defining these priority levels and entering them into Maximo, it will increase the Distribution Maintenance Branch's ability to respond to effectively and efficiently respond to customer's needs and it will aid in planning and scheduling daily tasks.	**Management's Action Plan:** Continue to develop the plan that began in FY2013 of Work Order prioritization (which follows the recommendations outlined). The prioritization will follow DC Waters Emergency Response Action Plan Incident Level Designations and Response Actions system where for example we will identify a Level 5 Incident as an extreme situation requiring immediate attention and where a Level 3 Incident is identified as a potentially emergency requiring attention in the coming days. All other Work Orders will prioritized by time. A detailed plan will be developed and distributed to various operational areas within the Customer Care and Operations group. **Implementation Date:** First Draft Prioritization Plan [Dec 2013] Final Draft Prioritization Plan [Jan 2014] Final Plan for Distribution [March 2014]

III. Maximo Capabilities		
Observation: Maximo has the ability to capture labor costs, materials costs, and equipment costs for each work order. Additionally, Maximo has the ability to allow for job planning which will detail how long a repair should take and what materials should be used. However, this functionality is currently not utilized by DC Water. Therefore, Management is not able to assess if the department's activities are cost-effective or efficient. Additionally, without utilizing this functionality, it is difficult for Management to effectively schedule their crews and to measure each individual crew's performance. **Risk:** Not being able to track costs prevents Management from making risk-based decisions for maintaining or replacing costly infrastructure. The inability to measure the output and efficiency of the maintenance crews may prevent Management from assessing the crew's performance and efficiency of their operations.	**Recommendation:** We recommend that Management begin to track labor costs, materials costs, and equipment costs in Maximo as well as utilizing the job planning functionality for planning and measuring crew performance. This will increase Management's insight into the most costly repairs and assist in prioritizing which pipes should be replaced. Further, once this data is captured in Maximo, it will assist with Management Reporting (**Finding IV**).	**Management's Action Plan:** Continue the development of our improved utilization measures (which follows the recommendations outlined) by executing the following cost of service improvement: (a) Reestablish standard Maximo job plans for each work/asset type (Main, Valve, Service, etc) which will be developed to include all estimated costs for crew hours, materials, equipment, and tools for each crew for each asset, and for each size (i.e. Omega 21-Main-8inch). (b) Develop improved processes and procedures for data input for pre work order activities (loading job plan to a work order) and post work activities (updating actual work order information). (c) Improve existing Utilization evaluation tools to account for and ensure that the new cost data is added to each completed work order. **Implementation Date:** Management Plan (a) [Mar 2014] Management Plan (b) [June 2014] Management Plan (c) [Sept. 2014]

IV. Management Reporting from Maximo		
Observation: The current management reports generated do not include all relevant information necessary to fully aid in Management's process for assessing the department's efficiency, effectiveness or quality of the work performed. Further, the current reports used for scheduling daily tasks (open work order report) and assessing the department's adherence to goals (closed work order report) must be manually sorted and filtered each time it is generated by the Manager of Distribution Maintenance Branch in order for the information and reporting to be useful. **Risk:** Ineffective reporting could result in Management not being able to efficiently coordinate priority work, properly schedule their crews, or adequately identify duplicate work orders easily with the current backlog (open work orders) reports available.	**Recommendation:** We recommend that IT assist Management in revising current reports utilized and create more user friendly reports that assist Management in decision making and planning. Suggested reports include: • Priority Issues - this report should be auto-delivered to Management and Supervisors everyday and include items with priority levels requiring a repair within 24 and 48 hours to ensure crews are meeting deadlines • "Aged" Reports - that can be generated weekly to capture duplicate items (customers who have called back numerous times) and items that have not been resolved timely • Valve Reports - that could assist in the planning and performance of valve maintenance Additionally, we recommend that Management implement a meeting to discuss "aged" work orders, that would include key members of the Distribution Control Branch and Customer Services, that would meet at least monthly to try to identify duplicates and prioritize existing work orders.	**Management's Action Plan:** We will follow the recommendations outlined and consult/engage the IT department. Additionally, we will establish a routine operational meeting with various departments/branches within Customer Care and Operations to discuss aging work orders. **Implementation Date:** Consult/engage the IT department [Dec 2013] Implementation of Reports [TBD; Apr 2014] Aging WO Meeting [Start Dec 2013; ongoing]

Additionally, the lack of accurate management reports prevents Management from making informed business decisions and being able to effectively communicate their needs to Senior Management. Further, information in reports could be inaccurate or ineffective because of the excessive sorting, adding, and deleting of information required to prepare meaningful reports.	Further, we recommend that Management establish an acceptable threshold for maximum work order age.	

V. Backlog		
Observation: Our review of the records pertaining to open work orders for Taps and Valves, indicated a significant volume of outdated or inaccurate information. Reports showing the current backlog associated with the Distribution Maintenance Branch reflect approximately 1,220 items. Of those items, 800 are classified as "Taps" work orders and 280 are classified as "Valves" work orders. With the exception of known or current "Taps" work orders, the Distribution Maintenance Branch concentrates their time on the remaining 140 emergency work orders that are currently in their backlog. Some taps work orders date back over five years. Of the 800 work orders, 725 are aged over 90 days. Additionally, the taps work orders may be duplicate records or they may have been previously addressed and not closed out in the system. Therefore, it is difficult to determine exactly how many taps work orders actually require attention. The valve repair order need to be prioritized before the Distribution Maintenance Branch can begin repairing and replacing them.	**Recommendation:** We recommend that Management implement a procedure to review outdated and incomplete data in Maximo to ensure only relevant and current work orders are in the system. Since this would require working with the Permits Department and potentially contacting customers to verify whether they still need a "tap," this could potentially be performed by an administrative assistant so as to not disrupt the daily work load of the maintenance crews and supervisors.	**Management's Action Plan:** We will follow the recommendations and engage the Permits Department to develop a procedure for cleaning up the old data and establishing protocols and procedures for minimizing any inaccurate data going forward. Additionally, DWS management has already begun the process of adjusting operational work flows and processes such that all Valve replacement work orders (excluding Emergency replacements) will be reviewed and assessed by DCB (and others) prior to creating and issuing replacement work orders to DMB. **Implementation Date:** Engage Permits Department and Develop Clean Up Backlog [July 2014]

However, Internal Audit noted that the Distribution Maintenance Branch is working with the Distribution Control Branch to identify a solution for properly addressing broken valve work orders. **Risk:** Customer needs may not be met due to work orders being ignored resulting in dissatisfied customers and poor public perception. Inaccurate data in the system can cause extra or unnecessary work as it requires end users to sort and filter data for reporting to be useful. Further, unfiltered reports could be skewed or erroneous. Additionally, inaccurate data could affect Management's decision making.		

VI. Training and Certifications		
Observation: We observed that the Distribution Maintenance Branch does not track employee completion of training courses or certifications that are required for distribution maintenance positions. Additionally, they do not maintain a list of required courses for each position, or a list of employees that have taken each course. We also noted that as a result of the recent Sewer Emergency Services Audit performed in FY13, the Department initiated a department-wide push to begin to collect and track data associated with employee training and certifications. As of the date of this report, this has not been completed. **Risk:** Without adequate tracking and monitoring related to employee completion of required training courses, the Distribution Maintenance Branch creates a risk of poor customer service, inefficient operations, inability to properly address emergency issues, and perhaps creating an unsafe working environment.	**Recommendation:** Internal Audit recommends that the Distribution Maintenance Branch work directly with HCM to assure that all required training courses for each position are captured and that the successful completion of all training courses by each required employee is monitored.	**Management's Action Plan:** We will follow the recommendations as outlined as well as work towards identifying any water distribution related training opportunities that are currently missing from the authority wide list of courses. **Implementation Date:** DMB Training Update & Monitor [Sept 2014; ongoing]

VII. Policies and Procedures		
Observation: The Distribution Maintenance Branch does not have updated policies and procedures that have been approved by Senior Management. The Department does have detailed instructions on how to execute repairs on the Water Main Infrastructure, which was created by Engineering. We noted that as a result of the recent Sewer Emergency Services Audit performed in FY13, the Department initiated a department-wide push to begin documenting policies and procedures in a consistent manner. As of the date of this report, this has not been completed. **Risk:** The lack of formalized policies and procedures may prevent management from establishing appropriate internal controls and may allow for inconsistent practices across the department, or adversely affect the timely communication of changes to established policies and procedures.	**Recommendation:** We recommend that management implement formalized policies and procedures to ensure consistency across the department. These policies should be approved by senior management and distributed to all departmental staff and updated at least annually.	**Management's Action Plan:** Continue the development of revised policies and standard operating procedures (which follows the recommendations outlined) that was started in FY2013 by DWS, DSS, DDCS, and DETS. **Implementation Date:** Formalize Policies & SOP [Sept. 2014; ongoing]

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Water Services - Distribution Control Branch

Internal Audit Report

November 8, 2013

INTERNAL AUDIT TEAM

Director: Joe Freiburger

Principal: Dennis Fitzgerald

Staff: Kaitlin O'Hara

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EXECUTIVE SUMMARY

Background

Within the Water Services department, six groups work together to operate and maintain a potable water transmission and distribution system, which delivers safe drinking water to DC residents. Those groups include:

- Drinking Water;
- Pumping Operations;
- Distribution Control Branch;
- Distribution Maintenance Branch;
- Fire Hydrants; and
- Technical Support Services.

As part of the FY13 Internal Audit Plan, two internal audits were performed under Water Services; the Distribution Maintenance Branch and the Distribution Control Branch. The Distribution Maintenance review was completed in September 2013, and the Distribution Control review was completed in October 2013. This review focuses on the Distribution Control Branch. However, as a result of the Distribution Maintenance Branch report, there were three findings that are applicable to the Distribution Control Branch as well. The findings were a need to address the following:

- Insufficient prioritization of open work orders in the existing system;
- Incomplete information and monitoring of staff training and certification; and,
- Policies and procedures need to be created, approved and distributed to department employees and updated at least on an annual basis.

These findings will be tracked for all Water Services' Departments on Internal Audit's Management Action Plan Report, and therefore will not be included in the findings for this report.

The Distribution Control Branch works closely with each Water Services department, as well as Customer Services, Engineering and various external customers to execute their daily activities and ensure the effective operations of the water distribution system. The Distribution Control Branch is comprised of 3 operational units; Investigation, Flushing, and Valve Operations. The Investigation crews are responsible for being the first to respond for all incoming customer calls, both emergency and non-emergency. The Flushing crews are responsible for enacting the annual unidirectional flushing plan based on EPA mandates, as well as spot flushing based on water quality needs. Finally, Valve Operations is responsible for ensuring the effective and efficient operation of valves throughout the water distribution system as well as assisting with capital improvement project needs. Each operational unit has its own KPI that they are responsible for achieving, as follows:

- Investigation crews must respond to emergency calls within 45 minutes;
- Flushing crews must flush 50% of pipes within the water distribution system annually; and
- Valve Operations must conduct 18,000 - 24,000 valve operations annually.

The Manager of the Distribution Control Branch, is responsible overseeing all three operational units. Two key positions reporting to him, the Valve Control Coordinator, who is responsible for coordinating Valve Operations with other departments and providing assistance to field operations; and a General Foreman, who oversees all the field crews. The Distribution Control Branch currently has just over 50 employees; including ten investigation response crews, five flushing crews, and eleven valve operations crews.

During FY13, the investigation crews closed out approximately 4,800 investigation work orders. Calls are received by the Command Center (under Customer Service), and the information is logged into Maximo. It is either classified as an emergency, which would trigger the need for DC Water to arrive on-site within 45 minutes; or non-emergency, which would be scheduled and responded to as resources are available. If excavation is required, the Investigation crews are not responsible for the repairs and maintenance of the water distribution system. Once on site, the Investigation crews gather information about the root cause of the complaint, the exact location of the potential issue, and update Maximo with any additional information. Once their investigation is complete, they close out the work order in Maximo, and a "child" work order is created and routed to the Distribution Maintenance Branch to complete the actual repair.

On an annual basis, the Flushing Foreman collaborates with Water Quality to determine the zones that will be flushed during the Flushing Season (March - November) to meet the EPA's regulation of 50% flushing of the water distribution system's pipes. The annual flushing program is based on water quality needs and the timing of the previous zone flushing. The plan is published on DC Water's internet site for public notification. Outside of the annual flushing program, Flushing crews may be called upon to execute spot flushing in certain areas based on a water quality complaint. Each zone that is flushed is tracked in Maximo.

The Valve crews' primary responsibility is to operate valves in support of construction activities on the distribution system. These activities are conducted by groups such as the Distribution Maintenance Branch and other DC Water departments. Supporting these activities is the Valve Control Coordinator, who is responsible for working closely with all groups to ensure the accuracy of the buried assets and to develop plans for operating the valves.

Objectives

The overall audit objective was to evaluate the effectiveness and efficiency of the operations and activities of the Water Services - Distribution Control Branch as well as to ensure compliance with applicable laws and regulations. Specific audit objectives included:

- To ensure that the Water Services - Distribution Control Branch is in compliance with DC Water policies and procedures, as well as applicable laws and regulations;
- To ensure that proper controls exist to monitor Distribution Control Branch activities;
- To ensure that that Distribution Control Branch activities are operating effectively and efficiently, as well as to ensure that personnel are adequately trained;
- To ensure that the quality of work being performed is accurately tracked and monitored; and
- To ensure that proper safeguards exist around Distribution Control Branch assets.

Audit Scope and Procedures

This audit was conducted based on the approved FY2013 internal audit plan. The audit was initiated in August 2013 and completed in September 2013. The audit included an evaluation of the physical controls, as well as the processes and procedures of the Water Services - Distribution Control Branch. The audit process included interviews with appropriate members of the Distribution Control Branch and Human Capital Management personnel. The audit process also included data analysis and substantive testing of a sample of investigation, flushing, and valve operations work orders, performance metrics, quality control of distribution control jobs, employee training and employee performance evaluations. Emphasis was placed on the identification of risks that could adversely affect Distribution Control Branch activities and the efficient performance of these activities.

Summary of Work

Internal audit concludes that the Distribution Control Branch effectively monitors and responds to investigations (emergency and non-emergency), flushing (unidirectional and spot) and valve operations. Internal Audit concludes that the internal controls surrounding the operational aspects of the Distribution Control Branch are effective.

Internal Audit has identified some items that should be addressed by management in order to further strengthen DC Water's Water Services Distribution Control Branch processes.
In particular, there is a need to address the following:

- Inconsistent methodology to track and identify valves in the water distribution system;
- Lack of automation in the Valve Exercising KPI calculations; and
- Insufficient reporting out of Maximo to analyze crew efficiency.

SC&H Consulting

By:

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Joe Freiburger, CPA , CIA

II. DETAILED OBSERVATIONS & RECOMMENDATIONS

I. Valve Identification and Communication		
Observation: Information on valve type, valve operation, and valve location is stored in multiple locations, such as hard copy maps, GIS, and valve cards. No one system has all of the accurate, up-to-date information. It is imperative to know the valve type and how many turns are required to operate the valve. Therefore, when valves are determined to be broken, or when they are repaired or replaced, all three locations may not be updated timely or accurately with the new information. Additionally, when a valve is determined to be non-operational, there is no standard process to ensure it is communicated to the necessary parties.	**Recommendation:** We recommend that management develop a plan to ensure valve type, operation and location are accurately recorded in a consistent system of record. Furthermore, we recommend that management develop a standard operating procedure for all parties who locate or operate valves to ensure they are properly communicating and recording their findings in the chosen system of record.	**Management's Action Plan:** A valve application was deployed to the field crews to capture all valve activity electronically in the system of record. This deployment includes the reporting of valve operability, type, and location. The application does provide a process to capture discrepancies between the field and GIS. The VCC group will be responsible for evaluating those discrepancies against available information and sending them to GIS for updating. **Implementation Date:** September 30, 2013

This information is critical to the Valve Control Coordinator, who is responsible for planning for construction projects as well as assisting in other repairs and flushing projects. **Risk:** Failure to maintain an accurate database of the location of valves in the water distribution system could result in ineffective planning for construction projects, repairs, and flushing plans. Moreover, inaccurate information on valve type and valve operation could lead operators to damage or break the valves.		

DC Water – 2013 Internal Audit
Water Services - Distribution Control Branch

SC&H GROUP, LLC

II. Valve Exercising KPI		
Observation: The Distribution Control Branch's KPI of valve exercises 18,000 to 24,000 per year is a simple count calculation (i.e. if a valve is exercised multiple times over the course of a year, it will be counted multiple times). However, in order to track and monitor this KPI, individual field data forms are manually counted and the total is added to the "DWS Director's Performance Measure Report." The field data forms are not retained and the only information available about valve exercising is the total number indicated on the Performance Measure report. Due to the manual nature of this control and forms not being retained, it is difficult to substantiate or re-perform the calculation.	**Recommendation:** Internal Audit recommends that information about specific valves exercised be captured in a consistent system of record, and that reporting be created to capture this KPI calculation to minimize human error. Reports should be created periodically in order to ensure enough valves are exercised at a given time to reach the KPI at the end of the year. Additionally, reports should be created to see the frequency of exercise on specific valves to ensure valves are exercised consistently.	**Management's Action Plan:** A valve application was deployed to the field crews to capture all valve activity electronically in the system of record. This deployment includes the reporting of valve operability, type, and location. **Implementation Date:** September 30, 2013

Risk: Without an adequate process to track and monitor the exercising of valves, there is a risk that certain valves are not exercised regularly, valve exercises are miscounted, or there is inaccurate valve information reported. Further, without retaining the forms, it is difficult to determine the accuracy of the counts without a paper trail.		

III. Crew Effectiveness and Efficiency		
Observation: The Distribution Control Branch does not have adequate reporting to monitor crew effectiveness or efficiency. They are currently utilizing Cost of Service and Availability reports. However, these reports are high level and not used in order to increase effectiveness or efficiency.	**Recommendation:** Internal Audit recommends that Management collaborate with IT to develop a method to capture relevant data in Maximo, or another system of record, to facilitate attaining relevant data to analyze crews' performance. Additionally, IT could assist Management in creating reports from Maximo that will capture quality and performance measures to assess crew effectiveness and efficiency.	**Management's Action Plan:** Mapping of how to capture work activities is being conducted within DCB in preparation for input into the system of record. Mobility effort put forth by DC Water is to address capturing the details in the system of record. **Implementation Date:** September 30, 2014 (dependent on available resources)

Risk: Failing to utilize reports that portray a detailed analysis of efficiency and effectiveness of DCB operations prevents management from accurately assessing the overall job quality of the work being performed, identifying opportunities for performance improvement, and isolating the sources of recurring problems.	Additionally, management should set clear expectations and communicate to employees which attributes management will be evaluating and tracking to establish individual and crew effectiveness and efficiency metrics.	

Presentation to Audit Committee
2013 IT Asset Inventory

December 12, 2013

DCWATER.COM

IT Asset Inventory History

- **WIS International**
  - In April 2012, DC Water engaged WIS International ("WIS"), a third party inventory counting service, to perform a physical inventory count of all the Authority's IT assets
  - After WIS completed their count, they reported 1,613 IT assets (or 37.4%) out of a total baseline of 4,305 IT assets as "missing "
  - Internal Audit was directed to commence an audit and locate the "missing" IT assets

- **2012 Internal Audit Report**
  - In November 2012, Internal Audit physically located and verified 829 (or 51.3%) of the 1,613 "missing" IT assets
  - Of the 784 assets that remained "missing" approximately 78% were aged 3+ years
  - In December 2012, Internal Audit issued a report on the IT Asset Inventory process and recommended improvements in the following areas: (1) IT Asset Database Management; (2) Policies and Procedures; and (3) Asset Tagging and Storage

2013 IT Asset Inventory

ProBar

- In July 2013, DC Water selected ProBar, a third party inventory counting service, by RFP, to perform a physical inventory of all the Authority's IT Desktop (ITSC), Network (DCNIT), and Fleet assets
- Summary results of ProBar inventory count:

Key Findings	
Initial Database of IT Assets	**3,435**
Found Assets	**2,793**
Missing Assets	**644**
% of Total Assets Missing	**18.70%**
New "Unlisted" Assets	**2,348**

- IT has begun a reconciliation process to validate ProBar's results

IT Asset Reconciliation Process

Reconciliation Process

- The 644 “missing” assets have been identified by IT as 291 ITSC (service desk assets), 337 DCNIT (network assets), and 16 non-hardware IT assets
- IT has begun locating the “missing” assets and “unlisted” assets
- Internal Audit and Finance are independently validating IT’s findings

Reconciliation Status Update

As of December 5, 2013

ITSC Assets

Category	Count
Probar	
Found	2744
New	610
Missing	291
DC Water	
Found Asset	254
Still Missing	37 (or 12.7%)

DC NIT Assets

Category	Count
Probar	
Found	50
New	197
Missing	337
DC Water	
Found Asset	257
Still Missing	80 (or 23.7%)

2012 Internal Audit Findings and Recommendations

Internal Audit Findings	Internal Audit Recommendations	Status
IT Asset Database: • Database Integrity • Inconsistent Dates • All Staff have access rights to change IT database • Inconsistent Documentation • Inconsistent Disposal Policies and Procedures • No Link to Lawson Financial System	*New IT Asset Database Management System*	• *IT has acquired a new inventory management system Passport from ASAP systems and will convert the existing system once final validation of the Probar inventory is complete:* • *Dates will be maintained* • *Access rights will be controlled* • *New standards will be enforced* • *Passport will be integrated with Lawson*
Policies and Procedures: • No detailed Policy and Procedure document	*Revised IT Policies and Procedures*	• *IT has recently updated its Asset Management Policy*
Asset Tagging • No uniform asset tagging methodology	*New Asset Tagging Methodology*	• *The new asset tags provided by Probar will be the asset id of record*
IT Cage in BP1 Warehouse • Untagged Assets • Improper storage • Lack of proper record keeping • Lack of Access to IT Cage	*Improved Warehouse Storage(IT Cage)*	• *The IT inventory cage is now organized by asset type and secured* • *All assets are entered into the asset database within 5 days of arriving at the warehouse* • *Access to the cage has been restricted to 3 people*
Physical IT Asset Inventories • No follow-up after Inventory count	*Periodic Inventory Counts by IT*	• *Quarterly inventory checks have been instituted*

Next Steps

- Internal Audit and Finance will continue to validate IT reconciliation and present final IT asset inventory report to the Audit Committee in February 2014
- IT will update Audit Committee regularly on remediation activities regarding Internal Audit recommendations
  - Status reports on conversion to the Passport system and integration with Lawson
- Additional IT asset management improvement opportunities
  - Investigate the potential to consolidate all inventory into the storage room in the IT building at Blue Plains and secure the door with card key access
  - Implement active asset monitoring capability
  - Investigate potential of 2-part asset tags to tag new assets upon arrival
  - Monitor procurements (e.g., p-card) to capture and tag all IT assets