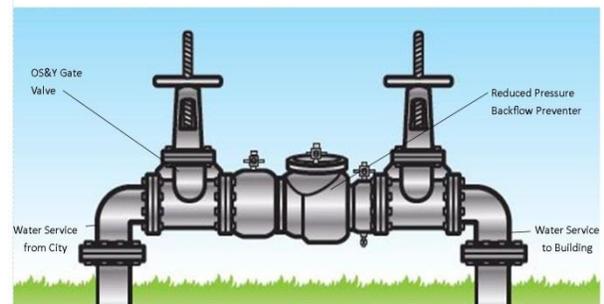


January 2018

Cross Connection Control Follow-up Performance Audit



Backflow prevention assemblies protect our drinking water supply.

City of Durham
Audit Services Department
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To: Audit Services Oversight Committee
From: Germaine F. Brewington, Director
Audit Services Department
Date: January 22, 2018
Subject: Cross Connection Control Follow-up Audit January 2018

The Audit Services Department staff completed the report for the Cross Connection Control Follow-up Performance Audit. The purpose of this audit was to:

- Verify if the proposed recommendations from the October 2015 Cross Connection Performance Audit were implemented by the Department of Water Management staff.

This report presents the observations, results, and recommendations of the Cross Connection Control Follow-up Audit. In response to this audit's recommendations, City Management concur with the recommendations made. The detailed Management Response to the recommendations is included with the attached report.

The Department of Audit Services staff would like to acknowledge the contributions of the staff from the Water Management Department, and specifically the staff overseeing the Cross Connection Control Program, in the completion of this audit.

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Audit Report Highlights

Background

The Cross-Connection Control (CCC) Program at the City of Durham, administered by the Department of Water Management, is required by the state and federal government to protect water systems from potential contamination or pollution. The Department of Audit Services staff performed the Cross Connection Control Performance Audit in October 2015. The purpose of the audit was to determine if adequate controls existed over the processes administered by the Cross-Connection Control staff at the City of Durham's Department of Water Management. The audit proposed five recommendations to address the areas of concern.

Purpose

The objective of the audit was to:

- Verify if the proposed recommendations from the Cross Connection Control Performance Audit (October 2015) were implemented by the Department of Water Management staff.

Cross Connection Control Follow-up Performance Audit

The Cross Connection Control Performance Audit dated October 2015 proposed five recommendations to management. Three recommendations were implemented, one was partially implemented and one was not implemented.

Highlights

The CCC staff have established/revised SOPs since the last audit. The new SOPs are comprehensive; however, they do not document a plan to address non-compliance with the annual testing requirements by commercial (non-residential) customers. Per CCC staff, a decision has been made to enforce non-compliance with annual testing requirements by commercial customers. The SOPs should document this practice. In addition, the implementation of the NEXGEN application to enhance the Cross Connection Control process appeared to be significantly behind schedule. During the last audit the CCC staff were in the initial stages of implementing NEXGEN, which was supposed to make the process less labor intensive. Two years later the system is still not implemented.

Audit Services Department

Internal Audit

The Audit Services Department serves a three-fold role at the City of Durham. Our number one goal is to provide independent, objective assurance that City processes are working effectively. Secondly, we serve as internal fraud examiners when fraud, waste, or abuse is alleged against a City employee or department. Finally, in order to constantly foster high ethical standards, we provide in-depth ethical training to all City employees on a rolling basis. To learn more, visit our CODI site or our page on the [City of Durham's website](#).

Audit Services Oversight Committee

In order to maintain its organizational independence, the Audit Services Department reports to the Audit Services Oversight Committee (ASOC) at a minimum of four times a year. The ASOC approves all proposed audit plans and completed audits prepared by Audit Services staff.

The Audit Services Oversight Committee is made up of six members: two City Council Members, three resident members, and one alternate City Council Member. The current members include two certified public accountants, academicians, and persons with business experience. The City Manager is an ex-officio, non-voting member of the ASOC.

Audit Services Oversight Committee Members

Chair:

Kim Anglin, CPA
Resident Member

Vice-Chair:

Jenna Meints, MSW, PhD, IRS EA, LCSW-A
Resident Member

Committee Members:

Steve Schewel
Mayor
City Council Member

Jillian Johnson
Mayor Pro-Tempore
City Council Member

Maticia Sims, CPA, CIA, CRMA
Resident Member

Charlie Reece
Alternate
City Council Member

Non-Voting Member:

Thomas J. Bonfield
City Manager

A cross-connection is a link between a potable (drinking) water system and a non-potable water system. Contamination can occur when a water supply line to a customer is connected to equipment containing a substance not fit for drinking, creating back-flow (reversal of normal flow of a liquid solid or gas). Installation and maintenance of appropriate backflow prevention assemblies or devices prevents contamination of supply lines from cross-connections.

The Cross-Connection Control (CCC) Program at the City of Durham, administered by the Department of Water Management, is required by the state and federal government to protect water systems from potential contamination or pollution. Staff in the CCC Program implement the City's Ordinance Chapter 70, "Utilities", Article VII, "Cross-Connection Control" which requires all industrial, commercial and irrigation customers to obtain a backflow permit and install backflow prevention assemblies.

Cross Connection Control (CCC) staff responsibilities

In complying with the Ordinance, CCC staff review building plans for residential and nonresidential buildings that show the locations of plumbing connections, and/or cross-connections and sign off on the certificates of occupancy. In addition they issue Backflow Preventer Permits and perform inspections for permits issued. Per City Ordinance Chapter 70, a user or permit holder shall have all permitted backflow preventers inspected and tested annually. CCC staff administer the annual testing requirement and ensure compliance with this requirement. CCC staff also administer the Tester Certification Program which trains individuals on how to install and test backflows.

Systems used

The CCC Group uses the Land Development Office (LDO) System to issue Backflow Preventer Permits, assign inspections and approve building plans that are assigned for their review by the Department of City/County Inspections staff. Based on the information obtained from the LDO System, the following applications were processed for fiscal year (FY) 2016 and FY 2017. See Table 1 below:

Table 1: Applications processed for fiscal years 2016 and 2017

	<u>FY 2016*</u>	<u>FY 2017*</u>
Total backflow inspections	933	1069
Total review of building plans	1386	1853
Total permits issued	674	952

*This information was not verified by the audit staff.

In addition to using the LDO System, the CCC staff also utilize an Access database to capture all backflows that are required to comply with the annual testing requirement.

Results of Cross Connection Control Audit dated October 2015

The Department of Audit Services staff performed the Cross Connection Control Performance Audit in October 2015. The purpose of the audit was to determine if adequate controls existed over the processes administered by the Cross-Connection Control staff at the City of Durham’s Department of Water Management.

Based on the field work performed, Audit Services staff concluded that the Cross-Connection Control (CCC) Group was efficient at performing backflow inspections, issuing backflow preventer permits and approving building plans that need reviews as a result of cross-connections. Controls could be strengthened as it pertained to monitoring compliance with the annual testing requirement for backflows. The CCC staff did not enforce non-compliance by commercial customers with the annual testing requirements as allowed by the Ordinance. Also, the CCC staff were not mandatorily opting in non-compliant residential customers into the Opt-In Program. Adequate controls also did not exist to ensure that annual testing is performed for residential customers voluntarily participating in the Opt-In Program. The CCC Group had draft written procedures; however, they were not adequate and did not address all the activities carried out by the CCC Group. The audit proposed five recommendations to address the areas of concern.

Objective

The objective of the follow-up audit was to:

- Verify if the proposed recommendations from the Cross Connection Control Performance Audit (October 2015) were implemented by the Department of Water Management staff.

Scope, Methodology, and Compliance

Scope

The scope of the audit included examining all current practices as they pertain to the proposed recommendations of the Cross Connection Control Audit (October 2015).

Methodology

Audit Services Department staff performed the following procedures to accomplish the objectives of the audit. Staff:

- Interviewed various City personnel responsible for implementing the proposed recommendations; and
- Obtained and reviewed policies, procedures, and documentation to support the implementation of the proposed recommendations.

During the audit, Audit Services Department staff also maintained awareness to the potential existence of fraud.

Compliance

Audit Services staff conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that Audit Services staff plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on the audit objectives. Audit Services staff believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Objective 1 Results Summary

TO VERIFY IF THE PROPOSED RECOMMENDATIONS FROM THE CROSS CONNECTION CONTROL PERFORMANCE AUDIT DATED OCTOBER 2015 WERE IMPLEMENTED BY THE DEPARTMENT OF WATER MANAGEMENT STAFF.

The recommendations in the Cross Connection Control Performance Audit dated October 2015 and the accompanying status of each recommendation follows:

Recommendations	Cross Connection Control Performance Audit (October 2015)	Status
Recommendation 1	Department of Water Management staff should either establish or revise their written standard operating procedures. <ul style="list-style-type: none"> • Outline procedures for all processes administered by the CCC staff; • Establish a specific plan to address non-compliance with the annual testing requirement. The plan should contain steps beyond the notice of violation letters, to ensure all reasonable efforts are utilized to ensure compliance with the testing requirement. Department management should determine whether or not to apply the various remedies available per Ordinance for non-compliance and document their decision; • Clearly define documentation (signed class roster and test results) that should be retained for the Certified Testing Program; and • Clearly outline the responsibilities of all CCC staff. 	Partially Implemented DWM staff have established SOPs for most processes. The current SOPs do not document non-compliance with the annual testing requirement by commercial(non-residential customers)
Recommendation 2	Department of Water Management staff should reconcile Backflow Preventer Permit revenues per the MUNIS System to revenues per the LDO System at least annually.	Implemented
Recommendation 3	Department of Water Management staff should strengthen monitoring of the residential Opt-In Program. A follow-up procedure should be established to ensure that all backflows submitted to the contractor are tested within a reasonable time period. In addition, staff should monitor accounts that are not in compliance, and ensure that they follow-up with the contractors regarding those accounts. The performance of the contractors should be evaluated on an annual basis to ensure they have the capacity to perform the work assigned to them.	Implemented

Recommendations	Cross Connection Control Performance Audit (October 2015)	Status
Recommendation 4	Department of Water Management staff should continue their efforts to implement a new system that can facilitate the process of managing the annual testing requirement for backflows. A reconciliation process should be established to ensure all inspections performed are captured into the new system	Not Implemented Based on the original schedule date and expectations, the implementation of the Next Gen System to enhance the Cross Connection Control Process appears to be significantly behind schedule.
Recommendation 5	Department of Water Management staff should ensure adequate record keeping is maintained as it relates to the Certified Training Program. At a minimum, signed roster sheets and a score sheet that captures the written examination location, date and time, results of all attendees and signature of the examination monitor responsible for administering all examinations should be maintained.	Implemented

Finding 1

Audit Services staff found:

Revised Standard Operating Procedures do not document a plan to address non-compliance with the annual testing requirements by commercial (non-residential) customers.

The CCC staff has established/ revised SOPs since the last audit. The new SOPs are comprehensive; however, they do not document a plan to address non-compliance with the annual testing requirements by commercial (non-residential) customers. Per CCC staff, a decision has been made to enforce non-compliance with annual testing requirements by commercial customers. The SOPs should document this practice. The development and use of written procedures are always important to the successful quality control system. Written procedures provide employees with information to perform a job properly and facilitate consistency, good quality, and better results. Lack of written procedures increases the risk of errors. The SOPs document the plan to address non-compliance with the annual testing requirement by residential customers.

SOPs do not address non-compliance with annual testing requirements for non-residential customers.

Finding 2

Audit Services staff found:

The implementation of the NEXGEN application to enhance the Cross Connection Control Process appears to be significantly behind schedule.

The access database is a repository of all backflows that are required to be tested annually; and is used to monitor compliance with the annual testing requirement for all the backflows captured in the database. A significant amount of up keep is required to maintain the database. During the last audit, department management were in the initial stages of implementing NEXGEN which was supposed to make the process less labor intensive. Two years later the system is still not implemented. The implementation budget was \$139,292 for this project and to date payments of \$103,987 have been made. Per CCC staff they have completed testing of the application and concluded that many revisions were needed. NEXGEN is currently making the necessary revisions to the application and will submit the revised application to CCC staff by early 2018. Based on discussions with CCC staff, Technology Solutions staff and per correspondence emails between CCC staff and NEXGEN, it appears that the implementation delay was partly due to NEXGEN not clearly understanding the needs of the CCC staff as end users. This lack of understanding resulted in NEXGEN having to make quite a few changes to re-vamp and customize the application to the needs of CCC staff. In addition, work assigned to the Technology Solutions Department staff related to developing a script that would enable NEXGEN and MUNIS to communicate was still in process. Per the Director of the Department of Water Management, without a script that enables MUNIS and NEXGEN to interface with each other, the NEXGEN application will not benefit the department over the existing database.

Two years after the 2015 audit, NEXGEN has not been implemented while 75% of payments have been made.

Conclusion

The Cross Connection Control Performance Audit dated October 2015 proposed five recommendations to management. Three recommendations were implemented, one was partially implemented and one was not implemented. The CCC staff have established/ revised SOPs since the last audit. The new SOPs are comprehensive; however, they do not document a plan to address non-compliance with the annual testing requirements by commercial (non-residential) customers. Per CCC staff, a decision has been made to enforce non-compliance with annual testing requirements by commercial customers. The SOPs should document this practice. In addition, the implementation of the NEXGEN application to enhance the Cross Connection Control process appeared to be significantly behind schedule. During the last audit the CCC staff were in the initial stages of implementing NEXGEN, which was supposed to make the process less labor intensive. Two years later the system is still not implemented.

Recommendation 1

The Department of Water Management should revise their written standard operating procedures to include the plan to address enforcement of non-compliance with the annual testing requirement by commercial (non-residential) customers.

Value Added: Risk Reduction, Compliance

Recommendation 2

The Department of Water Management staff in conjunction with Technology Solutions Department staff should assess whether the application provided by NEXGEN will meet the needs of the Cross Connection Group. Specifically, a determination needs to be made as to whether Technology Solutions Department staff can develop a script that will enable NEXGEN and MUNIS to communicate. The NEXGEN application will not benefit the Department of Water Management over the existing database without a script that enables MUNIS and NEXGEN to interface with each other. If it is determined that the application will meet the needs of the Cross Connection Group, the Departments of Water Management and Technology Solutions should ensure that NEXGEN is implemented as soon as possible. In addition, the Department of Water Management should also ensure that no additional payments are made to NEXGEN until the final product is delivered.

Value Added: Efficiency, Risk Reduction, Compliance

Value Added Legend



To learn more, visit our website at: durhamNC.gov/audit

Management Response



City of Durham
NORTH CAROLINA

Memo to: Dr. Germaine F. Brewington, Director of Audit Services
From: Kerry Goode, CIO/Director of Technology Solutions
Donald F. Greeley, Director of Water Management
Date: 1/17/2018
Subject: Management's Response to Recommendation
Cross Connection Control Follow-up Performance Audit January 2018

The following is the management's response to the Cross Connection Control Follow-up Performance Audit:

Recommendation 1:

The Department of Water Management (DWM) should revise their written standard operating procedures (SOPs) to include the plan to address enforcement of non-compliance with the annual testing requirement by commercial (non-residential) customers.

Management's Response:

We concur. Management is in full agreement with the recommendation. DWM will develop SOPs to address enforcement of non-compliance with commercial customers.

Implementation Date: Started developing draft SOPs in January 2018. Anticipated completion is February 2018.

Recommendation 2:

DWM staff in conjunction with Technology Solutions Department (TS) staff should assess whether the application provided by NEXGEN will meet the needs of the Cross Connection Group. Specifically, a determination needs to be made as to whether TS staff can develop a script that will enable NEXGEN and MUNIS to communicate. The NEXGEN application will not benefit DWM over the existing database without a script that enables MUNIS and NEXGEN to interface with each other. If it is determined that the application will meet the



needs of the Cross Connection Group, DWM and TS should ensure that NEXGEN is implemented as soon as possible. In addition, DWM should also ensure that no additional payments are made to NEXGEN until the final product is delivered.

Management's Response:

We concur. Management is in full agreement with the recommendation. TS and DWM will take the following steps to comply with the recommendation:

1. DWM and TS will re-engage with NEXGEN to ensure that the solution aligns to solve the business problem as defined in the project plan documentation from 2015.
2. If the solution aligns to solve the business problem, the Directors of TS and DWM will ensure that project managers are assigned from the City to work with the NEXGEN project manager to complete the project.
3. The Directors will also assign the appropriate resources from their departments to the project as needed.
4. The Directors will ensure that a project schedule is created and executed to get the project completed in a timely manner.
5. DWM will ensure no new payments are made unless substantial progress is made.

If the solution is not aligned to solve the business problem, TS will work with DWM to build a business case for a different solution that will be submitted to the IT Governance Steering Committee for approval.

Implementation Date: Started re-engagement in January 2018. Anticipated substantial completion by June 2018.

Distribution of Report

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