Cross Connection Control in Illinois

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(Recognize Ben Goeke Southern Illinois, Edwardsville – Environmental Resources Training Center)

Discussion Topics

The Legalities
Roles of Regulators and Water Supply Officials
Active Cross Connection Control Program
    Administration/Management
    Paperwork Tracking
Case Study Discussion

Legal precedent for cross connection control responsibility was laid in 1929 by the Indiana Appellate Court, in the Pennsylvania Railroad Company vs Lincoln Trust Company.

(Provided by Ben Goeke, SIUE-ERTC)

- Contaminated water entered the Fort Wayne public water supply through a cross connection with a water main owned by the Pennsylvania Railroad resulting in the death of a municipal customer.
- Judgement: "The city having permitted the railroad company to connect its water main with the water main of the City, was ***duty-bound*** to exercise reasonable care to see that no polluted and impure water was allowed to enter its mains through the water main of the railroad."

Federal Law/Safe Drinking Water Act

- 1974
  - Protective provisions for water sources, treatment requirements and distribution of potable water.
- 1996
  - Multiple Protection Barrier Concept formalized.
    - Cross Connection Control Program as protective barrier.

Primary Enforcement Authority

- Illinois EPA enforces the provisions of the SDWA
  - U.S. EPA establishes that provisions in the Illinois Register are at least as stringent as counterpart Federal Register regulations
    - State Law (415 ILCS)
    - State Regulation (35 & 77 IAC)

Illinois Environmental Protection Act (415 ILCS)

- Owners/Operators of public water supplies responsible for safe operation
- Establishes that the Illinois Pollution Control Board is responsible for creating regulations on how responsible parties ensure safe and adequate supplies of potable water
- Establishes the role of Illinois EPA and DPH in ensuring compliance with the statute and underlying regulations

35 IAC 604
77 IAC 890

- Water Supply Design, Operation and Maintenance Standards = 35 IAC 604
- Plumbing Code = 77 Ill. Adm. Code 890.

Deeper Dive into the Illinois Register

601.105 Definitions

"Cross-connection" means any physical connection or arrangement between two otherwise separate piping systems where flow from one system to the other is possible.

- NO MENTION OF RISK
  - Some cross connections are a good thing
    - E.G., an interconnection between two public water supplies of similar water quality and chemistry

604.1505 Cross Connection Control Program

a) All community water supplies, including those that meet the criteria in Section 17 (b) of the Act and any exempt community water supply as defined in Section 9.1 of the Public Water Supply Operations Act [415 ILCS 45], must have a cross connection control program to educate and inform water supply consumers regarding prevention of the entry of contaminants into the distribution system.

Guiding Principle:

- No physical connection shall be permitted between the potable portion of a supply and any other water supply not of equal or better bacteriological and chemical quality
  - Control of all cross-connections to a supply is the **responsibility of the owner or official custodian** of the supply.
  - The Illinois EPA may adopt specific conditions for control of unsafe cross-connections, which shall be complied with by the supplies of this State.

Establish local compliance/enforcement tool

- Water service agreement/ordinance customers must adhere to for the privilege of obtaining potable water from the public water supply
  - Acknowledge Illinois Register regulations overseen by the Illinois EPA and DPH as basis for local authority

Section 604.1505 Requires Local Cross Connection Control Program Must:

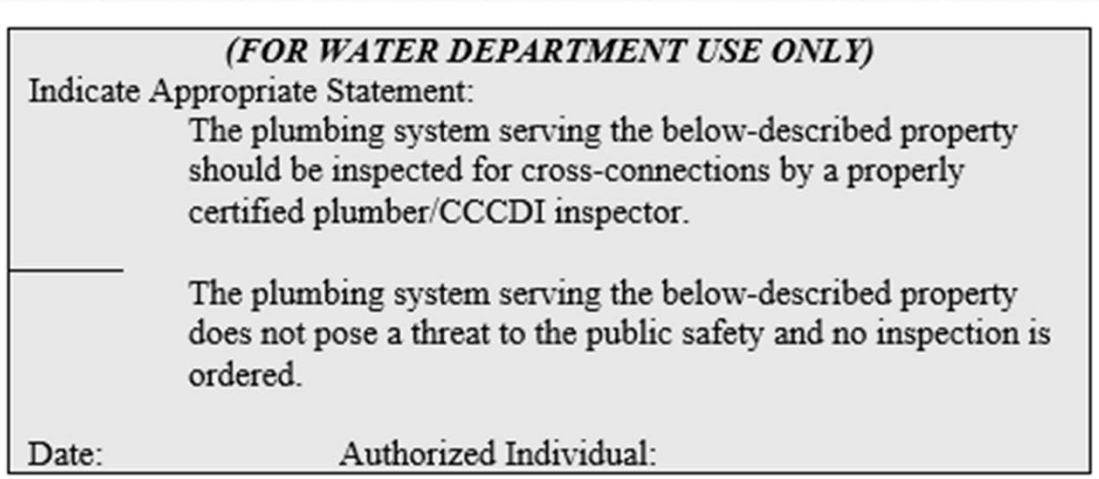
- Evaluate the cross connection risk for new customers
- Conduct a cross connection control survey of the distribution system every three years
- Review the risk of each service connection to the distribution system of the community water supply
- Track protective measures taken at high-risk service connection

Cross Connection Survey

- Use what you know about your community to make your Survey Form
  - Ask the questions that are relevant - Focus on high-risk activities you know, or suspect, are attached indirectly to your distribution system
    - E.g., lawn irrigation, hot tubes, hot water/boiler heat, etc.
  - Don't ask the questions you already know the answers to (or don't matter)
    - E.g., How may toilets do you have? Do you have a kitchen sink?
- Most importantly, use the Survey to educate your customers

For Residential Customers					
		Indicate Y or N if Present		**Cross Connection Protection Y or N**	**Describe (e.g., Check valve, Annual inspected device, air gap, separated from potable system, etc.)**
Boiler Heat:					
Dedicated Lawn Irrigation:					
Chemical Irrigation:					
Private Well:					
Hot Tub:					
Pool:					
Fire Protection System:					
Other Potential Cross Connection Risk:					
Other Potential Cross Connection Risk:					
Service Line Material coming through wall (Circle One): LEAD GALVANIZED COPPER PLASTIC IRON OTHER					

Put a Risk Evaluation Right on Form



(FOR WATER DEPARTMENT USE ONLY)

Indicate Appropriate Statement:

The plumbing system serving the below-described property should be inspected for cross-connections by a properly certified plumber/CCCDI inspector.

_____

The plumbing system serving the below-described property does not pose a threat to the public safety and no inspection is ordered.

Date: Authorized Individual:

Check them off a list of service connections, rate the risk of the connection and sort them as you receive them (You don't have to be fancy, just have a system!)

Educate if you want customers to be respond

Mom always said, "anything worth doing is worth doing correctly."

Dear Water Customer:

The Village of xxx is required to implement an active cross connection control program. A cross connection is any situation that allows a potable (safe) water source and a non-potable (potentially contaminated) water source the opportunity to contact each other. The Illinois Environmental Protection Agency (EPA) and the Illinois Department of Public Health (DPH) are responsible for ensuring that cross connections do not occur through the enforcement of cross connection control regulations. A cross connection between potable and non-potable water sources may cause anything from contamination of plumbing to sickness and even death of consumers.

The first step in implementing an approved program is the passage of an ordinance that is then submitted to the Illinois EPA. This ordinance has been passed and has been provided to the Illinois EPA.

The second step in the program is a survey of all customers served by our public water supply. On the reverse side of this letter is a survey that we hope you will complete and return to the Village Hall by *Enter Date*. Simply indicate the requested information that you have in your home or business. If you have other items that are not listed that might be a cross connection risk, please complete the "Other" spaces.

After we receive your survey, water supply officials will review the data and determine if additional information is needed. Again, these surveys are required by Illinois regulation and must be completed. If the water department does not receive your completed survey by the above-stated date, water department personnel will contact you to set a date at which time department personnel will assist you in completing the survey.

We thank you for your cooperation on this matter. If you have any questions, please don't hesitate to call _____ at _____.

Yours truly,

High Risk Service Connections

- To protect your distribution system, customers must comply with the plumbing code
- However, your concern is protecting distributed water and other consumers
  - Isolation vs. Containment

Isolation vs. Containment

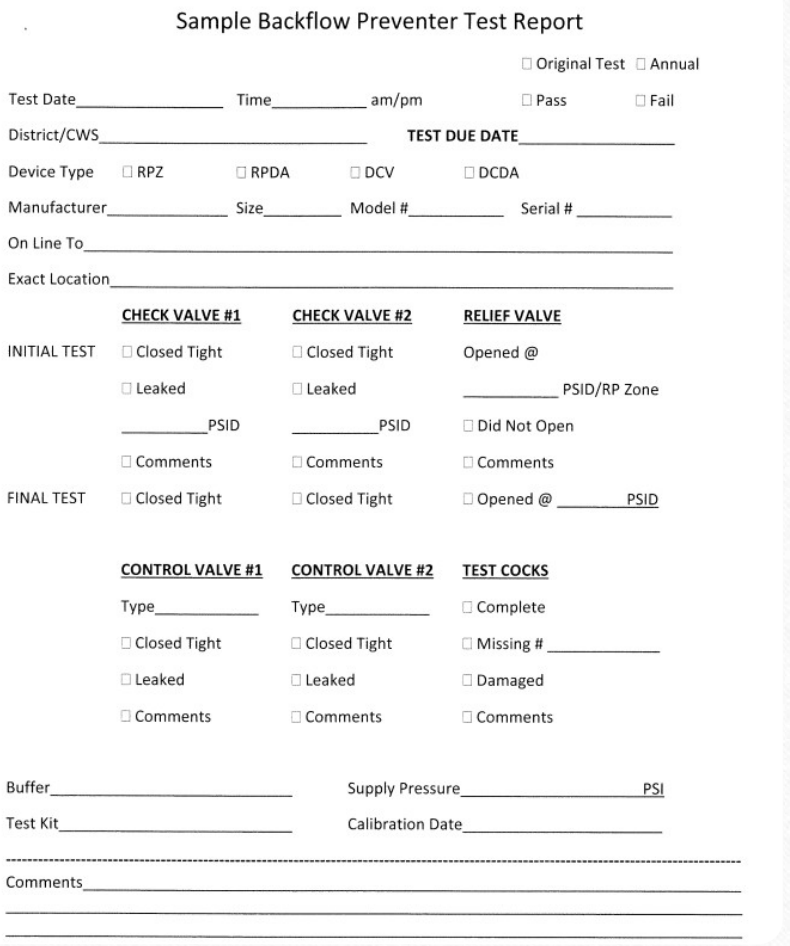
- Install a device that contains the entire high-risk service from the water main
  - E.g., A factory with many high-risk activities. Good for water system because only track one device. Bad for employees of factory because not necessarily protecting potable water on the premises
- Install a device(s) in the plumbing system of the high-risk service connection that isolates the potential contaminant and prevents backflow into the plumbing and into the water main
  - E.g., A home with dedicated lawn irrigation as their only risk. Good for homeowner because won't need an expansion tank as would with isolation. Arguably less protective for other customers of the water system

Cross Connection Control Devise Inspector(CCCDI) and Paperwork Required

- Whether using containment or isolation, testable device must be inspected annual by a properly credentialed licensed plumber (Section 604.1510)
  - Exception: a licensed water operator can get credentialed to inspect testable devices within water system facilities
- Records of each device inspection must be submitted to the water supply
  - Note: For devices owned and maintained by the water supply, each device inspected must have a tag attached listing the date of the most recent test, name of CCCDI, and type and date of repairs.

Sample Report

Provided by Ben Goeke, SIUE-ERTC



Sample Backflow Preventer Test Report

☐ Original Test ☐ Annual

Test Date_____ Time_____ am/pm ☐ Pass ☐ Fail

District/CWS_____ **TEST DUE DATE**_____

Device Type ☐ RPZ ☐ RPDA ☐ DCV ☐ DCDA

Manufacturer_____ Size_____ Model #_____ Serial # _____

On Line To_____

Exact Location_____

	CHECK VALVE #1	**CHECK VALVE #2**	**RELIEF VALVE**
INITIAL TEST	☐ Closed Tight	☐ Closed Tight	Opened @
	☐ Leaked	☐ Leaked	_____ PSID/RP Zone
	_____PSID	_____PSID	☐ Did Not Open
	☐ Comments	☐ Comments	☐ Comments
FINAL TEST	☐ Closed Tight	☐ Closed Tight	☐ Opened @ _____PSID

	CONTROL VALVE #1	**CONTROL VALVE #2**	**TEST COCKS**
	Type_____	Type_____	☐ Complete
	☐ Closed Tight	☐ Closed Tight	☐ Missing # _____
	☐ Leaked	☐ Leaked	☐ Damaged
	☐ Comments	☐ Comments	☐ Comments

Buffer_____ Supply Pressure_____PSI

Test Kit_____ Calibration Date_____

Comments_____

Test Form FAQs

- Most large to medium sized CWS will have a standard form for testers to complete. Smaller districts might not have a form and can ask CCCDI performing the test to provide the necessary paperwork.
- Some CWS utilize cloud based computer programs (Chicago uses Compliance Engine) or 3rd parties that manage all or some of the Cross Connection program (BSI and Schaumberg)
- Original form must be submitted to "official custodian" of CWS
- IEPA requires all CWS to maintain 10 years of paperwork for customers with testable backflow assemblies
- Testers will provide a copy to property owner, retain a copy for their records, and provide a maintenance log at the site of the assembly.
- 3rd party companies, such as BSI or Aqua Backflow, can be contracted to manage paperwork. They typically utilize online forms to submit test results and charge fees to testers which help cover program administration.

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A maintenance log must be maintained at the site of installation and must include:

A) make, model and serial number of the backflow preventer, and its location at the site;
B) date of each test;
C) name and approval number of person performing the test;
D) type of test kit used and date of its most recent calibration;
F) test results and a brief statement indicating whether the results pass or fail the test;
G) repairs or servicing required;
H) repairs and date completed; and
I) servicing performed and date completed.

Sidebar on Record Keeping

- Recently, a water system received an alleged violation for not ensuring "a tag attached listing the date of the most recent test, name of the CCCDI, and type and date of repairs. A maintenance log must be maintained at the site of the installation."
  - We disputed the validity of this accusation. Can only be applied to devices control on the water system facilities. Water Supply officials do not necessarily have "right of entry" to residential, business or industrial customer premises under Federal, State or Local statute. Hence, they have no ability to determine customer record keeping practices.

A Couple Things To Consider

- Are you struggling to have an active cross connection control program?
- Have you considered getting help?
  - Maybe there are ways to offset the cost of administering the program or using a third party to administer your program

On the form to the right, note of the following:

- States that form fee is $30
- Type of business and number of stories on building
- Re-test is listed as option
- System type is requested
- How do we interpret "Final Test" towards bottom?
- No buffer line? Not requirement and can be calculated with data provided
- Lists where to submit paperwork, this is the "official custodian" for Normal, IL

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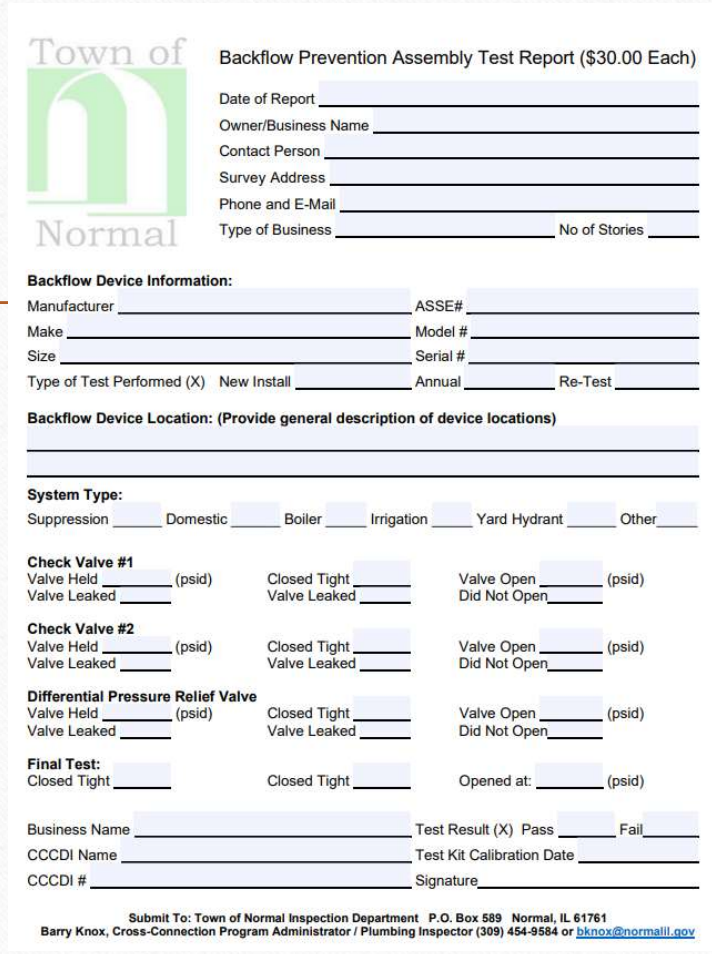

Town of Normal

Backflow Prevention Assembly Test Report ($30.00 Each)

Date of Report _____
Owner/Business Name _____
Contact Person _____
Survey Address _____
Phone and E-Mail _____
Type of Business _____ No of Stories _____

Backflow Device Information:

Manufacturer _____ ASSE# _____
Make _____ Model # _____
Size _____ Serial # _____
Type of Test Performed (X) New Install _____ Annual _____ Re-Test _____

Backflow Device Location: (Provide general description of device locations)

_____
_____

System Type:

Suppression _____ Domestic _____ Boiler _____ Irrigation _____ Yard Hydrant _____ Other_____

Check Valve #1
Valve Held _____ (psid) Closed Tight _____ Valve Open _____ (psid)
Valve Leaked _____ Valve Leaked _____ Did Not Open_____

Check Valve #2
Valve Held _____ (psid) Closed Tight _____ Valve Open _____ (psid)
Valve Leaked _____ Valve Leaked _____ Did Not Open_____

Differential Pressure Relief Valve
Valve Held _____ (psid) Closed Tight _____ Valve Open _____ (psid)
Valve Leaked _____ Valve Leaked _____ Did Not Open_____

Final Test:
Closed Tight _____ Closed Tight _____ Opened at: _____ (psid)

Business Name _____ Test Result (X) Pass _____ Fail_____
CCCDI Name _____ Test Kit Calibration Date _____
CCCDI # _____ Signature_____

Submit To: Town of Normal Inspection Department P.O. Box 589 Normal, IL 61761
Barry Knox, Cross-Connection Program Administrator / Plumbing Inspector (309) 454-9584 or bknox@normalil.gov

There are a variety of options from simple data management to total program administration:

- Cloud Based Data Management
  - SwiftComply Backflow
  - Syncta by Watts
  - VEPO CrossConnex
- Illinois based companies offering total program administration
  - Aqua Backflow
  - Backflow Solutions Inc.

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Backflow is Happening, Just Some Examples:

- Atrazine Tank Mix Backflow, lead to regulation – No program
  - Total plumbing replacement in many services
  - Over three years of pain and suffering
- Blue dye backflowed into plumbing system of an ice rink – Active Program
  - Containment device - no effect to the distribution system
  - Illinois DPH worked with facility

It happens, continued:

- Grass seed bedding material – active program that got circumvented
  - Commercial activity with a device required on firehydrant, employee went off the reservation
  - Good news, no pesticides, bad news meters were plugging up for over a year
- Miracle grow backflow into distribution system – active program that got circumvented
  - Homeowner picked a bad time to fill a tank from a garden hose, no pesticide
  - Quickly flushed out
- Water softener media backflow to neighbor's house– active program that did not detect risk
  - Rental property that discontinue use of water softener but failed to remove it, neighbor caught backflow
  - Fortunate, rental property where backflow occurred had a dialysis patient in residence that had home treatment unit

Bottom Line

- Have a program that meets regulation
  - May not keep you from being sued, but may allow you to prevail
- Questions?