

Cross-Connection Control and Backflow Prevention



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Outline of this Presentation



- EPA Paper
- Survey Example
- Regulatory Guidances

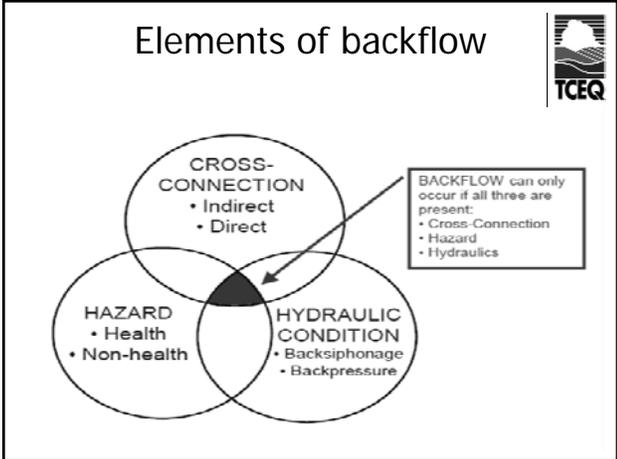


What we do:



1. Technical Assistance
2. Monitor
3. Surveys





Determining Vulnerability and Occurrence of Residential Backflow

TCEQ

Subject Area: Infrastructure

Determining Vulnerability and Occurrence of Residential Backflow

- Backflow susceptibility
- Meters to detect backflow

TCEQ

Approach



1. Determine what operational variables and physical characteristics make distribution systems vulnerable to pressure transients – resulted in development of a risk matrix

Characteristics that Increase Backflow Susceptibility



- System size
- Low operating pressures
- Surface water/Groundwater source
- Absence of distribution storage facilities
- Significant variation in DS topography

Characteristics that Increase Backflow Susceptibility (cont'd)



- Higher pump capacity and downstream velocities
- Absence of surge relief
- Reduced system reliability

Risk Matrix



- Developed based on the assumption that if certain characteristics of a DS could be correlated to a higher number of backflow incidents, then these characteristics might be considered as predictors of the risk level for backflow

Table 2.1
Risk matrix

Physical factor	Data	Weight of risk	Score
Nominal working pressure in the system	20-40 psi	5	
	41-60 psi	3	
	61-80 psi	2	
	81-100 psi	1	
	101-125 psi	1	
Maximum elevation difference in system	> 125 psi	0	
	> 500 ft	6	
	251-500 ft	5	
	101-250 ft	3	
Typical pressure fluctuation in a day	50-100 ft	2	
	<50 ft	1	
	> 40 psi	5	
	31-40 psi	4	
	21-30 psi	4	
	11-20 psi	2	
Environmental factors	5-10 psi	1	
	< 5 psi	0	
	Month of the year		
Human error factors	June - October	2	
	November - May	0	
Training/Education	Agency does not have training and/or education in cross-connection control	5	
	Agency has training and/or education in cross-connection	0	
TOTAL SCORE			



Backflow Monitoring



Direct hydraulic monitoring

(a) Backflow sensing meters

1. Integrating with Automated Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) fixed network

(b) Monitors integrated with backflow prevention assemblies

Backflow Monitoring



- Indirect hydraulic monitoring
 - (a) Pressure monitors
 - (b) Advanced leak detection systems
 - (c) Acoustic monitoring systems

Results



- Backflow occurred in 1.6 % of the residential connections each month and 5% of residences each year.
- Backflow is more widespread than previously thought and occurs in all areas regardless of susceptibility.

Survey Example



- Wholesaler selling water to Public Water Supplier (PWS)
- PWS using reclaimed water for irrigation
- Required RP at the interconnection
- What if the PWS had an effective CCC Program?
- Generated pressure issues and complaints





Survey Example

★ **Valley Morning Star**
★ **Headline reads: *Community Forum: Homeowners should be treated respectfully***
★ **May 20, 2010 5:00 AM**



Survey Example



- Contacted TCEQ for assistance.
- Survey conducted
- Cited deficiencies and gave deadline
- Provided educational information

Regulatory Guidance Documents



- Two new documents published this year:
 1. RG-478 Establishing and Managing an Effective Cross-Connection Control Program
 2. RG-493 Accuracy Testing of Gauges Used for Testing Backflow-Prevention Assemblies

RG-478



- Authority: State rules, Plumbing codes, and local ordinances
- Backflow Prevention Assemblies: Type, installation, testing
- Customer Service Inspections
- Education and Training

RG-493



- Accuracy vs Calibrating
- Applicable rule
- Who can test
- Gauges used on non-potable water lines

Contact Information



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