

Effective Cross-Connection: Why & How

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TCEQ Requirements

1. Service Agreement, Plumbing Ordinance or Regulation [290.46(i)]
2. Customer Service Inspections [290.46(j)]
3. Backflow, Siphonage [290.44(h)]

Plumbing Ordinance

1. Adopt an adequate plumbing ordinance (example in handout) or;
2. Adopt an adequate plumbing regulation or;
3. Use an adequate service agreement [290.47(b) Appendix B] (example in handout)

The adoption of a plumbing code does not necessarily meet this requirement.

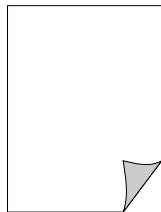
Plumbing Ordinance

Why?

To prohibit unacceptable plumbing practices and cross-connections.

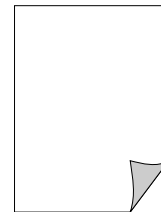
Plumbing Ordinance

- See Example Service Agreement Form in Handout



Plumbing Ordinance

- See Example Plumbing Ordinance in Handout



Customer Service Inspections

When is a CSI required?

- New Construction
- Material Improvements of existing plumbing
- PWS suspects a cross-connection

Customer Service Inspections

Who can perform the inspections?

- TCEQ Licensed Customer Service Inspector
- TSBPE Licensed WSPS
- TSBPE Plumbing Inspectors

Licensed plumbers can no longer perform CSIs unless they are WSPS or PI. Effective in 2000.

Customer Service Inspections

Why are they required?

- to prevent cross-connections, potential contaminant hazards and illegal plumbing materials.

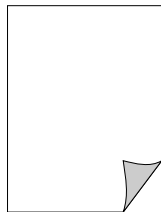
Customer Service Inspections

The water system is required to maintain each properly completed customer service inspection certificate for a minimum of 10 years.

Any form which varies from the format specified in 290.47(d) of this title must be approved by the TCEQ prior to being placed into use. [290.46(j)]

Customer Service Inspections

- See Example CSI Form in Handout



Definitions 290.38

- Health hazard - involves a substance that can cause death, illness, spread disease or has a high probability of causing such effects.
- Non-health hazard - involves a substance which is not a health hazard, but is a nuisance, or is aesthetically objectionable.

Definitions 290.38

Potential contamination hazard - a condition which, by its location, has a **reasonable** probability of being used incorrectly .

Backflow, Siphonage

Backflow Prevention Assembly

- When do you need one?
 - At any connection where an actual or potential contamination hazard exists. [290.47(i) Appendix I]
- Why do you need one?
 - To protect the PWS from contaminants

Backflow, Siphonage

- Where should it be located?
 - At the meter, unless an adequate internal cross-connection control program is in effect. (PWS can be more stringent)

Backflow, Siphonage

- The use of a backflow prevention assembly at the service entrance shall be considered additional protection and shall not negate the use of internal protection as outlined and enforced by local plumbing codes.

Backflow, Siphonage

Backflow Prevention Assembly

- Who can install it?
 - We do not regulate who can install backflow devices. Check with local authority and / or codes.
- Who can test?
 - TCEQ-licensed testers ONLY.

Backflow, Siphonage

When do you test a device?

- When each device is installed and annually thereafter if installed on a health hazard.

Backflow, Siphonage

- Backflow Prevention Assembly Testers on firelines, must contact the State Fire Marshall's Office

Backflow, Siphonage

The Water system is required to maintain the properly completed original backflow prevention assembly test report form for a minimum of 3 years for each test. (It must be signed and dated) [290.44(h)(4)(C)]

They can be kept electronically.

Backflow, Siphonage

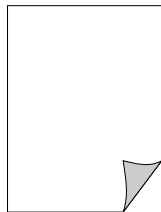
Any form which varies from the format specified in 290.47(f) of this title must be approved by the TCEQ prior to being placed into use. [290.44(h)(4)(C)].

Backflow, Siphonage

- At any residence or establishment where there is no actual or potential contamination hazard, a backflow prevention assembly is not required.

Backflow Test Report Form

- See Example BPAT Report Form in Handout

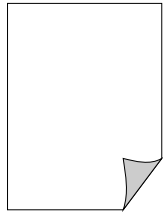


Approved Assemblies

- RPBA - (reduce pressure principle assembly) health and non-health (backpress. & back siph.)
- PVB - (pressure vacuum breaker) health and non-health (only installed for back siphonage)
- AVB - (atmospheric vacuum breaker) health and non-health (only installed for back siph.)
- DCVA - (double check valve assembly) only installed for non-health (backpress. & back siph.)

Appendix I

- See Handout



- TCEQ 290.44(h) rules are minimum
- PWS can be more stringent than 290.44(h) rules

References

- American Water Works Association (AWWA) Manual M14
(800)926-7337
www.awwa.org
- University of Southern California - Manual of Cross-Connection Control
(213) 740-2032

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§290.47(i) Appendix I. Assessment of Hazard and Selection of Assemblies.

Appendix I: Assessment of Hazards and Selection of Assemblies

The following table lists many common hazards. It is not an all-inclusive list of the hazards which may be found connected to public water systems.

Premises Isolation: Description of Premises	Assessment of Hazard	Required Assembly
Aircraft and missile plants	Health	RPBA or AG
Animal feedlots	Health	RPBA or AG
Automotive plants	Health	RPBA or AG
Breweries	Health	RPBA or AG
Canneries, packing houses and rendering plants	Health	RPBA or AG
Commercial car wash facilities	Health	RPBA or AG
Commercial laundries	Health	RPBA or AG
Cold storage facilities	Health	RPBA or AG
Connection to sewer pipe	Health	AG
Dairies	Health	RPBA or AG
Docks and dockside facilities	Health	RPBA or AG
Dye works	Health	RPBA or AG
Food and beverage processing plants	Health	RPBA or AG
Hospitals, morgues, mortuaries, medical clinics, dental clinics, veterinary clinics, autopsy facilities, sanitariums, and medical labs	Health	RPBA or AG
Metal manufacturing, cleaning, processing, and fabrication plants	Health	RPBA or AG
Microchip fabrication facilities	Health	RPBA or AG
Paper and paper products plants	Health	RPBA or AG
Petroleum processing or storage facilities	Health	RPBA or AG
Photo and film processing	Health	RPBA or AG
Pleasure-boat marinas	Health	RPBA or AG
Private/Individual/Unmonitored Wells	Health	RPBA or AG
Reclaimed water systems	Health	RPBA or AG
Restricted, classified or other closed facilities	Health	RPBA or AG
Rubber plants	Health	RPBA or AG
Sewage lift stations	Health	RPBA or AG
Sewage treatment plants	Health	RPBA or AG
Slaughter houses	Health	RPBA or AG
Steam plants	Health	RPBA or AG
Tall buildings or elevation differences where the highest outlet is 80 feet or more above the meter	Nonhealth	DCVA
Internal Protection: Description of Cross Connection	Assessment of Hazard	Recommended Assembly
Aspirators	Nonhealth†	AVB
Aspirator (medical)	Health	AVB or PVB
Autoclaves	Health	RPBA
Autopsy and mortuary equipment	Health	AVB or PVB
Bedpan washers	Health	AVB or PVB

Internal Protection:		
Description of Cross Connection	Assessment of Hazard	Recommended Assembly
<i>(continued from page 77)</i>		
Connection to industrial fluid systems	Health	RPBA
Connection to plating tanks	Health	RPBA
Connection to salt-water cooling systems	Health	RPBA
Connection to sewer pipe	Health	AG
Cooling towers with chemical additives	Health	AG
Cuspidors	Health	AVB or PVB
Degreasing equipment	Nonhealth†	DCVA
Domestic space-heating boiler	Nonhealth†	RPBA
Dye vats or machines	Health	RPBA
Fire-fighting system (toxic liquid foam concentrates)	Health	RPBA
Flexible shower heads	Nonhealth†	AVB or PVB
Heating equipment:		
Commercial	Nonhealth†	RPBA
Domestic	Nonhealth†	DCVA
Hose bibbs	Nonhealth†	AVB
Irrigation systems:		
with chemical additives	Health	RPBA
without chemical additives	Nonhealth†	DCVA, AVB, or PVB
Kitchen equipment—Commercial	Nonhealth†	AVB
Lab bench equipment	Health or Nonhealth†	AVB or PVB
Ornamental fountains	Health	AVB or PVB
Swimming pools:		
Private	Nonhealth†	PVB or AG
Public	Nonhealth†	RPBA or AG
Sewage pump	Health	AG
Sewage ejectors	Health	AG
Shampoo basins	Nonhealth†	AVB
Specimen tanks	Health	AVB or PVB
Steam generators	Nonhealth†	RPBA
Steam tables	Nonhealth†	AVB
Sterilizers	Health	RPBA
Tank vats or other vessels containing toxic substances	Health	RPBA
Trap primers	Health	AG
Vending machines	Nonhealth†	RPBA or PVB
Watering troughs	Health	AG or PVB

- Note:** AG = air gap; AVB = atmospheric vacuum breaker; DCVA = double check valve backflow prevention assembly; PVB = pressure vacuum breaker; RPBA = reduced-pressure principle backflow prevention assembly.
- AVBs and PVBs may be used to isolate health hazards under certain conditions, that is, backsiphonage situations. Additional area of premises isolation may be required.
 - † Where a greater hazard exists (due to toxicity or other potential health impact) additional area protection with RPBA is required.