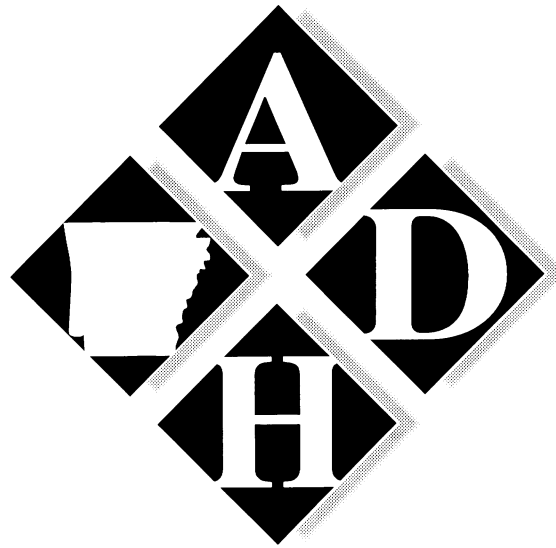


Implementing a Cross-Connection Control Program



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ARKANSAS DEPARTMENT OF HEALTH
DIVISION OF ENGINEERING

IMPLEMENTING A CROSS-CONNECTION CONTROL PROGRAM

- WHAT IS A CROSS-CONNECTION?
 - A cross-connection is a link between a potable water system and a non-potable system or a system of questionable water quality.

- WHY IMPLEMENT A CROSS-CONNECTION CONTROL PROGRAM (CCCP)?
 - To protect the public water system (PWS) from contamination or pollution via backflow due to:
 - *back pressure.
 - *back siphonage.

 - It is required by State regulations! The regulatory basis for the program is:
 - *The Arkansas Department of Health (ADH) *Rules and Regulations Pertaining to Public Water Systems*.

- WHAT ARE THE TYPES OF CROSS-CONNECTION CONTROL PROGRAMS?
 - A *containment program* (this type program is the minimum program required by the Arkansas Department of Health).
 - *protects the PWS water mains.
 - *does not generally protect users within the customer's facility.

 - An *isolation program* (this type program is not required by the Arkansas Department of Health; however, the local water utility may elect to conduct this type of CCCP):
 - *protects the PWS water mains.
 - *protects the users within the customer's facility.

- BACKFLOW HYDRAULICS
 - A backflow occurrence = link + force;
therefore,
 - A backflow occurrence = cross-connection + back pressure or back siphonage.

 - Note: backpressure = downstream pressure higher than supply pressure.
backsiphonage = partial vacuum created in supply piping system.

- CROSS-CONNECTION CONTROL PROGRAM DEFINITIONS
 - Facility with backflow potential*: a commercial or industrial facility where:
 - *there is an auxiliary water supply which is connected to the potable water piping; or,

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*there is piping for conveying liquids other than potable water, where that piping is under pressure and is installed in proximity to potable water piping; or,

*there is intricate plumbing which makes it impractical to ascertain whether or not cross-connections exist; or,

*there are cross-connections or potential cross-connections.

-*High hazard backflow potential facility*: the substance which could backflow into the potable water system is hazardous to human health.

-*Medium hazard backflow potential facility*: the substance which could backflow into the potable water system is objectionable, but is not an unreasonable risk to human health and/or the possibility of back pressure exists in the downstream piping.

-*Low hazard backflow potential facility*: the substance which could backflow is objectionable, but no unreasonable risk to human health and there is no possibility of back pressure in the downstream piping.

- WHO IS AFFECTED BY THE CROSS-CONNECTION CONTROL PROGRAM?

-Commercial and industrial (C & I) customers of the PWS (residential units are not generally included in this program. It is up to the local water utility to define what they perceive to be a commercial establishment):

Note: Examples = car wash, mortuary, hospital, nursing home, veterinary clinic, dentist's office, medical clinic, health clinic, farms or other sites diluting pesticides or herbicides, zoo, marina, bait shop, public swimming pool, dairy, chemical plant, laboratory, facilities where livestock, such as, cattle, hogs, horses, poultry, emus, ostriches are held for sale or slaughter, etc.

- THE FIRST STEP

-The public water system administrative body must pass an...

*ordinance; or,

*by-law; or,

*policy; or,

*other legal instrument

...to establish legal authority for program enforcement.

- THE SECOND STEP

-Identify all commercial and industrial customers served.

-Tentatively classify the customers as to backflow potential hazard level; namely,

*high hazard

*medium hazard

*low hazard

...in accordance with the established definitions for hazard levels.

- THE THIRD STEP

- Schedule the survey of *high hazard* facilities first.
- Notify the facilities of pending inspections and schedule the dates that are satisfactory to all parties.
- Begin the inspections.
- After the completing the *high hazard* facilities, survey what is perceived to be the *medium hazard* facilities, and then the *low hazard* sites.

- INSPECTING THE FACILITIES

- Confirm the hazard classification. For example, if the site was tentatively classified as a *high hazard* facility, and your inspection verifies that it is truly a *high hazard* site, then an approved air gap or approved reduced pressure principle backflow prevention assembly (RP) is required:
 - *in the service line upstream of the meter; or,
 - *in the service line downstream of the meter; or,
 - *within the plumbing system.
- NOTE! For high hazard sites, if the RP or air gap is located within the plumbing system, the establishment must be reinspected annually by the local water utility to verify that plumbing connections have not been made upstream of the containment device. For medium hazard sites, if the backflow preventer (BFP) is installed within the plumbing system, the establishment must be inspected at least once every three years by the local water utility to verify that no high hazard fixtures have been connected to the system and/or that no medium hazard fixtures have been connected upstream of the first BFP. Low hazard establishments must be reinspected every five years to insure the classification has not changed.

- OTHER ELEMENTS OF THE CROSS-CONNECTION CONTROL PROGRAM

- When new construction permits are issued:
 - *review plans from a cross-connection control perspective and address containment protection.
 - *follow-up the plan review with a site inspection when the construction is completed. Make sure the BFP is properly installed.
- New or expanded fire protection systems:
 - *backflow prevention is required in accordance with the Arkansas Department of Health's *Policy for Cross-Connection Control on Fire Protection Systems*.
- For multi-use developments where the ultimate hazard is unknown:
 - *the designer of the plumbing system must address future use of a RP-type BFP without its use reducing fire protection ratings or reducing domestic water main pressures below the established minimum.
 - *For domestic water, BFPs must be the approved type per the ASPC.
 - *For fire protection systems, DCs must meet AWWA C510; RPs C511.

- All backflow prevention assemblies required by the CCCP shall be tested within 10 days of initial installation and annually thereafter by a certified tester per the *Arkansas State Plumbing Code (ASPC)*.
- Improperly functioning BFP's shall be promptly repaired in accordance with the ASPC or appropriate action shall be taken by the water utility in accordance with their local ordinance or other legal instrument.

- THE FOURTH STEP

- The following records shall be maintained by the PWS. The records will be reviewed by analysts of the ADH during the *sanitary surveys* of the water utility:
 - *the name of the person assigned primary responsibility for administering the CCCP.
 - *a list of all C & I facilities served by the PWS.
 - *a list of all C & I facilities with backflow prevention assemblies.
 - *pertinent information about each BFP (size, make, model, location, annual retest date, and test reports).

- SPECIAL CONDITIONS AFFECTING THE RETROFITTING OF EXISTING PLUMBING SYSTEMS:

- Special consideration may be given when the following conditions exist:
 - *RP installation will result in residual pressures less than 15 psig.
 - *RP or DC installation will result in residual pressures less than that necessary to meet fire protection standards.

- NON-LIMITATION OF LIABILITY

- Program compliance with the *Rules and Regulations Pertaining to Public Water Systems* does not release the city, water district or association from compliance with the requirements of the *Arkansas State Plumbing Code*.

- QUESTIONS ABOUT IMPLEMENTING A CCCP

- If you have any questions about implementing your cross-connection control program contact:
 - *Arkansas Department of Health
Attn: John Hedgecock (Mail Slot #37)
4815 West Markham St.
Little Rock, AR 72205
Telephone number: 501-661-2623
FAX number: 501-661-2032

**ARKANSAS DEPARTMENT OF HEALTH
DIVISION OF ENGINEERING**

IMPLEMENTING A CROSS CONNECTION CONTROL PROGRAM
APPENDIX I.

THE WATER PURVEYOR'S LEGAL RESPONSIBILITIES

The water purveyor's legal responsibilities include, but are not limited to the following:

- Assure safe and wholesome potable drinking water to consumers.
- Comply with federal, state, and local regulations:
 - Arkansas: *Rules and Regulations Pertaining to Public Water Systems.*
 - Arkansas State Plumbing Code.
 - Local Backflow Prevention Ordinance.
- Prevent pollution and/or contamination of the public water system via backflow occurrences:
 - Conduct Cross Connection Control Program.
- Make reasonable and prudent decisions:
 - Indifference by city administrative officials, water utility managers or utility operators to problems associated with a public water system may constitute negligence in a court of law.
- Quickly respond to emergency situations:
 - Pre-planning is essential.
 - Prepare SOPs or written plans.
 - Establish a chain of command for emergencies.
 - Consider emergency communications requirements.

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APPENDIX II.
SEVEN ESSENTIAL ELEMENTS OF A CCCP!

- Legal Authority (one of the following):
 - Ordinance
 - Resolution
 - Rule
 - Service contract
 - Policy
 - Other legal instrument

- Approved Backflow Preventers. Maintain a list of approved backflow prevention assemblies for:
 - Reduced Pressure Principle Backflow Prevention Assembly (RP).
 - Double Check Valve Assembly (DC).Note: ADH maintains a list of approved BFPs.

- Survey Program:
 - Inspect and retrofit existing facilities with backflow prevention assemblies where needed.

- Testing & Maintenance :
 - RP's and DC's shall be tested annually; certified Assembly Test Technician (ATT) required for testing.
 - Licensed plumber certified as a Assembly Repair Technician (ART) required to repair RP's or DC's on the customer's side of meter. Assembly Repair Technician certification required to repair RP's or DC's on the utility side of the meter but a plumber's license is not required.Note: The ADH maintains a list of certified ATT's & ART's.

- New Construction:
 - Review plans for new construction from CCCP perspective. Address containment protection.
 - Follow-up plan review with site inspection upon completion of construction.

- For multi-use development where the ultimate hazard is unknown, service lines (including fire service lines) shall be hydraulically designed for future installation of RP devices without reducing fire protection ratings.
- Check for appropriate backflow prevention assembly in new or expanded fire protection systems.
 - *DC or air gap for standard systems
 - *RP or air gap where system utilizes anti-freeze or other chemicals.
- Records: Maintain detailed and defensible records.
 - Name of person responsible for the CCCP.
 - Listing of all commercial and industrial (C&I) facilities on the PWS.
 - List of all C & I facilities with BFPs installed.
 - List only the *containment* RP or DC backflow prevention assembly in place at each facility (make, model, size, location, annual retest date). If the *isolation* configuration is utilized by water utility then list *all* RP and DC backflow prevention assemblies within the facility.
- Education and training:
 - Stay current in regard to cross connection control:
 - *Read literature (magazines, etc.)
 - *Attend district meetings.
 - *Go to CCCP courses offered at SAU-TECH and/or by private contractors.
 - *Attend seminars and workshops.
 - Establish good public relations:
 - *Where possible notify the public-at-large of the regulatory requirement for cross connection control and explain why it is important and necessary to protect the public water system. Notification might be accomplished via the newspaper, business club meetings, etc.
 - *Make an appointment with the facility manager when conducting a survey, brief him on regulatory requirements and ask that someone from his organization accompany you during your inspection.

**ARKANSAS DEPARTMENT OF HEALTH
DIVISION OF ENGINEERING
IMPLEMENTING A CROSS CONNECTION CONTROL PROGRAM**

APPENDIX III.

SUGGESTIONS IN THE WRITING OF THE ORDINANCE

- **INTENT:**

- To comply with the requirements of the Arkansas *Rules and Regulations Pertaining to Public Water Systems*.
- To adopt a backflow prevention city ordinance or other legal instrument in order to protect the health, safety and welfare of the people. This ordinance does not replace or supercede any requirements of the *Arkansas State Plumbing Code*.

- **PURPOSE:**

- To protect the public potable water supply.
- To isolate at the service connection any pollution or contamination that may occur within a consumer's premises.
- To provide for enforcement of an effective program of cross connection control and backflow prevention.

- **DEFINITIONS (as used within the ordinance):**

Define terms such as:

- Backflow.
- Double check valve assembly (DC).
- Reduced pressure principle backflow prevention assembly (RP).
- Water purveyor.
- Approved backflow prevention assembly.
- Auxiliary water supply.
- Contamination.
- Pollution.
- Cross Connection.
- Other definitions as required.

- **OPERATIONAL CRITERIA:**

- Describe who is affected; i.e., commercial and industrial users only.
- Delineate responsibilities.
- Describe the degrees of hazard.
- Describe the types of protective devices to be used.
- Establish authority for surveys and/or inspections.
- Address cross connections and potential cross connections.
- Describe approach to restricted access to premises.
- Describe requirement for testing of the BFPs.

- FACILITIES REQUIRING BACKFLOW PROTECTION:

-List facilities which may require an RP at the service connection such as:

- *automatic car washes.
- *exterminators.
- *facilities with commercial boilers or chilled water systems.
- *fire protection systems.
- *hospitals, medical clinics, dental clinics, nursing homes, mortuaries, morgues, autopsy facilities and convalescent homes, veterinary clinics, and health clinics.
- *irrigation systems.
- *laboratories (industrial, commercial, medical and school).
- *radiator and battery repair or processing shops.
- *restricted, classified or other closed facilities.
- *sand, gravel and concrete plants.
- *wastewater treatment plants, pump stations and storm water pumping facilities.
- *marinas, docks and other waterfront facilities.
- *brooder houses, feed lots or stock pens used for the purpose of raising, feeding, or holding for sale or slaughter of cattle, horses, poultry, emus, ostriches, rabbits, hogs, or other livestock.
- *commercial farms.
- *zoos
- *Plants processing petroleum products.
- *Commercial swimming pools.
- *Plants handling radioactive materials.
- *Plants producing, diluting or otherwise processing pesticides or herbicides.
- *Dairies.
- *Chemical plants.
- *Others with suspected high hazards.

-List facilities which may require a DC at the service connection such as:

- *Apartment houses.
- *Tall buildings (over four floors).
- *Beauty parlors and barber shops.
- *Hotels and motels.
- *Restaurants and other food handling facilities.
- *Fire protection systems
- *Others, as found with suspected medium hazards.

- APPROVAL OF BACKFLOW-PREVENTION ASSEMBLIES:
 - Note requirement for use of approved backflow prevention assemblies in accordance with the *Arkansas State Plumbing Code (ASPC)* and the *ADH Policy for Cross-Connection Control of Fire Protection Systems*.
- ENFORCEMENT:
 - Describe the penalties and/or actions for non-compliance.
 - Discuss the notice of violations.
 - Address the right of entry.
- OWNERSHIP:
 - State who is responsible for cost of hardware and its installation and testing.
- TESTING AND MAINTENANCE:
 - State who is responsible for the annual testing, maintenance, repairs and replacement of backflow prevention assemblies.
 - Describe requirement that owner will notify the PWS of annual test results, repairs made to unit, etc.
- NEW CONSTRUCTION AND MODIFICATIONS TO SYSTEMS:
 - Include statement that new construction and modifications or expansions of systems will fall under the purview of this ordinance during the permit process.
- CONFLICTING ORDINANCES:
 - Write statement repealing conflicting ordinances or parts of ordinances.
- DATES:
 - State effective date of the ordinance.
 - Give compliance deadlines (up to 120 days depending upon the situation).

(NOTE: A fill-in-the-blank type *sample ordinance* is available from the ADH upon request.)