NEED TO KNOW CRITERIA FOR:

BACKFLOW ASSEMBLY TESTER (T)
CROSS-CONNECTION SPECIALIST (S)
BACKFLOW ASSEMBLY REPAIRER (R)

NEED TO KNOW MATERIAL

(T, S, R) Backflow Industry Definitions

(T, S, R) Theory of Backflow and Cross-Connection:

A. Hydraulics of water in piping
B. How backflow occurs
C. Types of actual cross connections
D. Degrees of hazard

(T, S, R) Backflow Principals, Hydraulics and Pressures:

A. Atmospheric
B. Absolute
C. Negative
D. Gauge
E. Static
F. Fluctuating
G. Gradient
H. Water column
I. Aspirator/Venturi effects

(T, S, R) How Backflow Occurs, Hazards and Protection:

A. Backpressure
B. Backsiphonage
C. Cross Connections- Direct and Indirect
D. Degrees of Hazard- Pollutant / non-health hazard, Contaminant / health hazard
E. Service protection, internal protection

(T, S, R) Backflow Product Performance, Hydraulics and Science:

A. Assembly testing and trouble shooting
B. Backflow, Backpressure, Backsiphonage
C. Cavitation, Vacuum, Water Hammer,
D. Thermal Expansion, Differential Pressure
E. Special Tools, Assembly Spring Containment
F. Assembly Working Pressures, Temperature
G. Assembly Pressure Loss, Continuous/Intermittent Pressure
H. Installation Orientation and Degree of Hazard
I. Hydraulics of water in piping
J. Venturi/Aspirator effect

(T, S, R) Codes and Regulations:

A. Federal regulation
B. State regulation
C. Local regulation
D. Plumbing code
E. Reading blueprints

(S) Cross-Connection Control Program Elements:

A. Legal authority
B. Trained Personnel
C. List of approved assemblies
D. Record keeping
E. Public education
F. Conducting surveys
G. Testing & Repair program

(T, S, R) Backflow Terminology, Methods, Applications, Operation, Installation:

A. Air Gaps
B. Atmospheric Vacuum Breakers
C. Reduced Pressure Assemblies
D. Double Check Assemblies
E. RP Detector Assembly
F. DC Detector Assembly
G. Spill Resistant Vacuum Breaker
H. Pressure Vacuum Breaker Assembly
I. Backflow Devices
J. Test Kits

(T, S, R) Trouble Shooting and Repair:

A. Air gap (ANSI A112.1.2)
B. Atmospheric Vacuum Breaker (ASSE 1001)
C. Pressure Vacuum Breaker Assembly (ASSE 1020)
D. Spill Resistant Pressure Vacuum Breaker Assembly (ASSE 1056)
E. Double Check and Double Check Detector Assembly (ASSE 1015, 1048)
F. Reduced Pressure and Reduced Pressure Detector Assembly (ASSE 1013, 1047)
G. Non-testable devices
H. ASSE standards 1002, 1011, 1012, 1019, 1021, 1022, 1024, 1032, 1035, 1052.

(T, S, R) Special Conditions:

A. Hot water
B. Thermal expansion
C. Pressure fluctuation
D. Freezing conditions
E. Manifold installations
F. Critical services
G. Accessibility
H. Location

(T, S, R) Responsibilities:

A. Consumer
B. Tester
    1.Tester safety during testing and repair
    2.Test report distribution and record keeping
    3.Proper test procedures (USC 10th edition test procedures)
C. Plumbing Insp.
D. Federal/State Gov.
E. Health Dept.
F. Water Purveyor
G. Contractor

(T, S, R) Assembly Generations 1ST, 2ND, 3RD:

A. 1st - Febco , Wilkins, Watts, Apollo
B. 2nd- Febco , Wilkins, Watts, Apollo
C. 3rd "Febco , Wilkins, Watts, Apollo , lead free"

(T, S, R) Assembly Testing & Troubleshooting:

A. USC 10th edition test procedures
B. Know when the assembly is in good working order
C. Understand what your gauge is reading when the assembly has a problem
D. System Hydraulics

(T, S, R) What Affects Assemblies:

A. Type of water usage
B. Water quality
C. Water temperature

(T, S, R) Safety

(T, R) Reclaim Water Site Inspection:

A. Separation of systems
B. Ponding
C. Overspray
D. Hygiene
E. System Identification
F. Signage
G. Backflow requirements

(T, S, R) Backflow Assemblies:

A. Approval of assemblies and the approval process

(T, S, R) Backflow Incidents:

(T, R) Repair Preparations:

A. Know assembly makes, models, types, sizes
B. Know the internal parts of the different assemblies
C. Having all internal parts necessary for assembly being repaired
D. Have all of the necessary tools needed for the repair
E. Proper customer notification for shutdown
F. Tester Safety

(T, R) Repair Procedures:

A. Turn off service (WA, IR, FP, RC)
B. Disassemble
    1. Inspect all parts
    2. Replace all worn or damaged parts
    3. Replace all O-rings and other rubber parts
    4. Clean and flush out assembly
C. Reassemble
D. Pressurize, vent, and test

(T, S, R) Assembly Testing Equipment and Operation.

(S) Cross-Connection Inspections, Survey:

A. Pre-Inspection Preparation
    1. Notification
    2. Safety Equipment
    3. Tools, Camera
    4. Blueprints
B. Cross-Connections
    1. Common
    2. Potential
    3. Reoccurring
    4. Protected & Unprotected
C. Safety Concerns
    1. Confined Spaces
    2. Chemical, Electrical, Fire
    3. Poisonous, Insects and Animals
    4. Vehicle Traffic
    5. Working Elevation
D. Inspection Check List:
    1. System identification, backflow device and assembly location, potential and actual cross-connection identification.
    2. Identification of physical backflow protection including manufacturer, model, size, serial number, and location including building numbers.
    3. Record name of specialist, date and time of inspection.
    4. Record any additional observations.
E. Review Actions to be taken
    1. Knowledge of common or potential cross- connections
    2. Recommended backflow protection
    3. Complete proper documentation of survey

Sources of Information:

1. AWWA Introduction to Water Distribution
2. AWWA M14 Manual
3. ASSE Guide to Cross-Connection Protection Devices and Assemblies
4. ASSE Series 5000 Standards
5. IAPMO Uniform Plumbing Code
6. IAPMO Backflow Prevention Reference Manual
7. Bureau of Reclamation Water Reuse Guidebook
8. USC FCCCHR Manual of Cross-Connection Control
9. 28 Years in the Cross-Connection Control Industry