

Vertical Assemblies Begin Evaluation Process

A topic of much conversation is the Approval status of backflow prevention assemblies installed in the vertical orientation. Although the Foundation's *List of Approved Backflow Prevention Assemblies* only lists one assembly which is Approved in the vertical orientation, many manufacturers have initiated the evaluation process for vertical Approval. Some work has already begun in the Foundation Laboratory for vertical testing. This requires quite a bit of modification to the normal piping set-up for testing of backflow preventers.

For vertical Approval, each assembly will need to be installed in the vertical orientation with vertical piping upstream of the assembly. The piping downstream of the assembly must be returned to the level of the downstream discharge piping of the Laboratory. Not only does this require a greater-than-normal amount of work, but the piping arrangements for each size require initial calibration curves. Once all of the piping arrangements have been finalized and calibrated, the evaluation process will begin. It is expected that many assemblies will be tested in the Laboratory this summer. However, it is important to realize that three of each size and model of assembly must be installed in the field vertically for a one year field evaluation

after successful completion of the Laboratory evaluation process.

The Foundation has always maintained that assemblies are only Approved for installation in the orientation under which they were tested. This is why each assembly must successfully complete the Laboratory *and* Field evaluation process vertically before Approval can be granted. The problem encountered in the field is the difficulty in locating field sites for vertical assemblies. The general policy of the Foundation has been that only one of the required field assemblies is permitted to be installed on a static (non-flowing) water line, such as a fire sprinkler system. Since most vertical installations are needed for fire systems, there is a problem in locating potential field sites which are vertical and under flowing conditions. The Foundation is considering relaxing the requirement to allow for two of the three field assemblies to be installed on static water lines for the vertical field evaluation. This should make it much easier for the manufacturer to locate acceptable field sites and, after all, this is the condition under which most vertical assemblies will be installed once Approved.

The Final Approval of any new backflow preventers in the vertical





The 3 psi Buffer

When testing the reduced pressure principle backflow prevention assembly, the Foundation recommends the first check differential reading to be at least three pounds per square inch - differential (psid) above the relief valve opening point. This is to prevent water from spitting out of the relief valve every time the line pressure fluctuates. Some agencies do not require the three psid "buffer," because it does not have an actual effect on the backflow preventer's ability to prevent backflow. In this case, the question becomes, "What is an acceptable value?"

Some agencies do not have a set policy regarding this buffer as long as the backflow preventer prevents backflow. Other agencies strictly hold to the three psid buffer rule without any variance. The important point to remember is that the buffer does not affect the assembly's

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Highlights

-  Vertical Testing
-  The 3 psi Buffer
-  "Practice" Assemblies
-  Training Tools

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W²elcome!

...New Members

The Foundation continues to see a growth in Membership. This growth allows the Foundation to provide better service while maintaining the Membership fee schedule. Following is a list of the most recent additions to the Foundation's Membership Program. Thank you for your support of the Foundation and welcome to the Membership Program.

A-A Affordable Backflow Service, Inc.
 A-Cut Above Contracting
 Dial One/AA-All Rooter Service
 City of Aspen
 Bilardi Construction Inc.
 Bill's Plumbing & Maintenance
 Bud Davis Backhoe
 Comprehensive Property Management

Connecticut Cross Connections
 Gretsfield P & H
 City of Hollister
 Hume Lake Christian Camps
 Indiana Dept. of Environmental Management
 Jack Wormley Plumbing
 Jet Landscaping
 Landscape Resource Group

Dan J. Lewis
 M.C.R. Landscape
 Mariana Rancho County Water District
 Medicine Hat College
 City of Needles
 Pennsylvania Power & Light Company
 City of Phoenix
 Price Brothers Construction
 Village of Red Hook
 Reliance Manufacturing Company
 Sandia National Laboratories
 University of California - Santa Barbara
 John A. Scheben, Jr.
 City of Sierra Madre
 City of Steamboat Springs
 Utah Valley Community College
 Winzler & Kelly

<p><i>Tester Course</i></p> <p>The Foundation Laboratory</p> <p>FULL 13 - 17 July 1992 5 - 9 October 1992 4 - 8 January 1993</p> <p>Incline Village, NV</p> <p>FULL 3 - 7 August 1992</p> <p>Non-Members \$750.00 Members \$600.00</p>	<p><i>Program Specialist Course</i></p> <p>USC Campus</p> <p>20 - 24 July 1992 11 - 15 January 1993</p> <p>Non-Members \$800.00 Members \$640.00</p>
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Courses may be added throughout the year. Please contact the Foundation office for information on courses in your area or for an application for the next USC Training Course. You may also send a hard copy of a purchase order or a check to the Foundation office to reserve a space. Please be advised that courses have been filling six to eight weeks in advance.

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A Purchase Order may also be sent via FAX to the Foundation office at (213) 740-8399

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Vertical Approval Process

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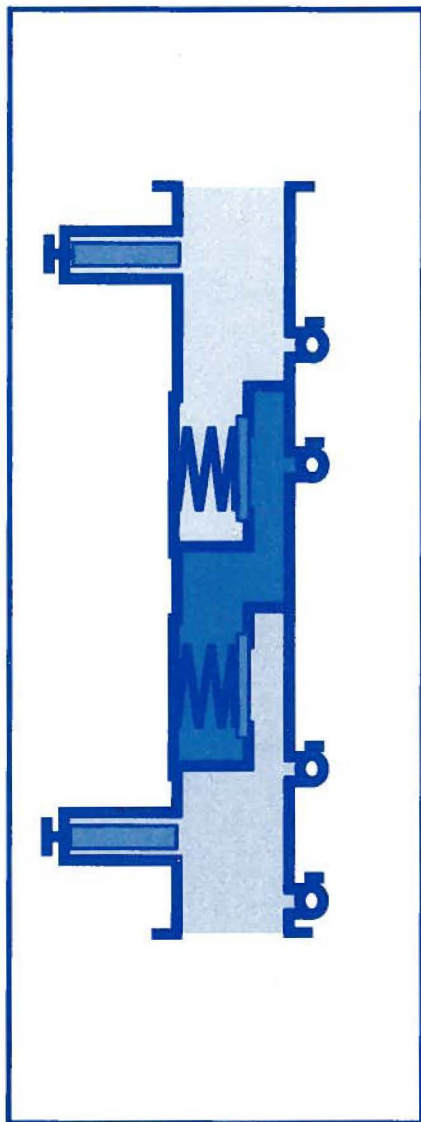
orientation is not expected for some time, since the assemblies are required to undergo the one year field evaluation after the successful completion of the laboratory evaluation.

It is not expected that new assemblies would be added to the Approved List within the next year. As changes are made, however, the Membership of the Foundation will be informed via the *List of Approved Backflow Prevention Assemblies*.

Field Sites Needed

Field sites are needed for the evaluation of various sizes and types of backflow preventers. Three of each size and model of backflow prevention assembly which has completed the Foundation's laboratory evaluation are required to be installed in acceptable field sites. Once each month, members of the Foundation's Engineering Staff will field test the assemblies to determine if they are operating properly. Three field assemblies for each size and model of backflow preventer evaluated must complete twelve consecutive months of continuous trouble free service. At the end of the twelve months the assemblies

are disassembled to determine if there are any problems. If there are no problems, the assembly is listed on the Foundation's *List of Approved Backflow Prevention Assemblies*.



the past and could be used. Details of what is required for a field evaluation site are available in the Eighth Edition of the *Manual of Cross-Connection Control Section 10.2.1.3* (p153). 💧

If you have one or more locations which may be acceptable as a field site please contact the Foundation Laboratory at (213) 481-3336. In general, only field sites protecting against non-health hazards are acceptable. Field assemblies should be in a readily accessible location during normal business hours and turning off the water for a period of time should not present a problem to the water user. Most of the Foundation's current field sites are in California, but field sites in other western states have been used in

3 psi buffer

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ability to prevent backflow. However, a buffer is necessary to minimize the nuisance of water discharging to the area surrounding the backflow preventer. Assemblies which are installed outdoors will not normally present a great problem. In many cases reduced pressure principle backflow prevention assemblies are installed inside of a mechanical room or at other indoor locations. In this case, the discharging of water onto the floor area surrounding the backflow prevention assembly could present a problem to the occupant of the property. Therefore, a consistent policy regarding the "buffer" should be initiated and followed. 💧

Video Working Together for Safe Water

This fifteen minute video is designed to explain how backflow can occur and what can be done to prevent it. It is ideal for introducing non-technical groups or students to the concepts of backflow prevention. It is especially helpful in explaining these concepts to water consumers which may not fully understand why they must meet certain cross-connection control requirements.

Contact the Foundation office for an order form or send a hard copy of a purchase order or a check to the Foundation office to receive a copy of the Film/Video. *California residents must add appropriate sales tax.*

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VHS Video:
Non-Members \$80.00
Members \$60.00

16mm Film:
Non-Members \$200.00
Members \$150.00

Tests Performed Between Annual Tests

Normally each type of backflow prevention assembly is tested at least once each year. However, there may be times when a backflow preventer is malfunctioning and repairs are necessary during the year. This would be the case if the relief valve of a reduced pressure principle assembly is leaking or spitting. When the certified tester is called upon to determine why the relief valve is leaking, a field test is performed. Once the problem is determined and repairs are made, another test is performed to assure proper operation of the assembly.

After the final test has been completed the tester will normally give a copy of the test results to the owner of the property, the local water agency, and the local health department, depending upon local requirements. A problem observed in some areas has to do with the water or health agency's ability to record these test results. Some agencies have a particular method of keeping records which makes it very difficult or impossible to record test results more than once each year. If the agency's reference number or service number is not included on the test form itself, then some agencies can't input the data. In some cases these test results are not placed on permanent record. Not being able to record these test results creates more problems down the road.

One of the most important pieces of information which water and health agencies should keep on their records is the reasons for a backflow preventer not passing its annual test. If the backflow preventer has problems between annual tests, it is even more imperative to have this recorded in the agency's records. If proper records are not maintained, a

backflow preventer could malfunction several times during the course of a year, but if the one test performed on the anniversary date of installation shows no problems, the records show that the assembly has always worked properly. In reality, there may be a problem which needs to be looked into more seriously.

Another potential problem comes when the customer receives letters from the water or health agency asking for a test to be performed on the backflow preventer. Often the letter will state that each backflow preventer must be tested at least once each year. If the property owner just had the assembly repaired and tested two months before receiv-

ing this notice, he or she will not likely be willing to pay for another test, especially if test results had been sent to the administrative authority only two months earlier.

These are just some potential problems which may occur. Administrative authorities having jurisdiction over cross-connection control programs should have a system set-up to handle test results of backflow preventers which require repair or testing between annual tests. As long as the testing was performed by a certified tester, the results should be placed on the agency's records indicating a failure, repair and successful final test. 💧

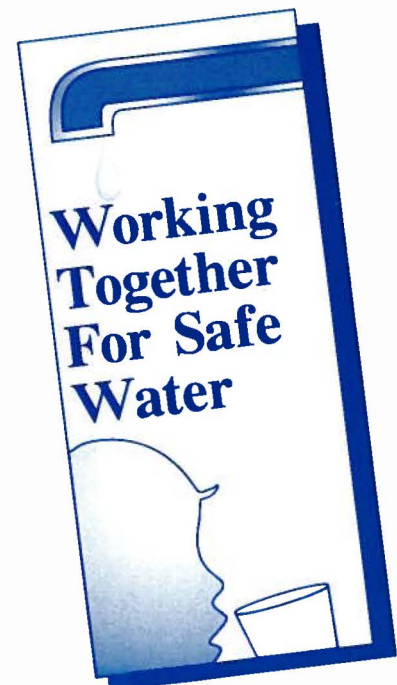
Cross-Connection Control Informational Brochures

The informational brochure entitled *Working Together for Safe Water* is a great complement to the slide presentation *The Essentials of Cross-Connection Control*. You'll be able to explain all the concepts of cross-connection control to your audience using the slide presentation. Then you can hand out the brochure. This gives those in attendance something to take with them which will help them to comprehend fully the topics discussed.

The brochures come with the name, address and telephone number of the ordering agency, so those who desire more information or have questions, can call you directly.

This brochure can be used to explain the basic concepts of cross-connection control, helping water users understand why they may need to install a backflow preventer or comply with periodic testing requirements. To request a sample of the brochure with an order form, contact the Foundation office at:

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Manual Update - Ninth Edition

The Manual Review Committee has been working diligently on the Ninth Edition of the *Manual of Cross-Connection Control*. The big question many are concerned about is the possible changing of test procedures to a direction-of-flow test on the check valves of the double check valve assembly. Unfortunately, there is no additional news to report. The committee is still discussing the possibility, but no decision has been made to date. Should the procedures change, testers should not worry since the procedure will be very similar to that used in testing the check valve on the pressure vacuum breaker assembly.

The Ninth Edition will certainly contain more illustrations to simplify the understanding of several concepts contained in the Manual. It has been

proposed that the testing procedures be expanded to an illustrated version with almost every step being accompanied by an illustration representing exactly what the tester should do during that step. Although this has been proposed, the practicality of this expanded test procedure is being examined. Since each procedure contains several steps, many more illustrations would have to be created and added to the Manual. It has not yet been determined whether the illustrations would produce the desired added benefit to the readers of the Manual.

The Manual Review Committee has hope of completing the Specifications for backflow preventers under the Ninth Edition by the end of July. At this point the manufacturers of backflow preventers will be asked to

comment on the practicality of producing assemblies that can meet the new Specifications. With all of this required to finish off the Ninth Edition of the Manual, it is likely that the Manual will not actually be published until the last quarter of this year or possibly January of 1993. As progress is made, the Members will be kept up-to-date and each Member of the Foundation will receive a complimentary copy of the Ninth Edition when it is published. If Members have comments or suggestions for the upcoming Manual please send them to the Manual Review Committee care of the Foundation Office. 💧

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Training and Education

The Foundation is pleased to report that 1992 has seen unusually high demand for both the *Short Course for the Training of Backflow Prevention Assembly Testers* and the *Short Course for the Training of Cross-Connection Control Program Specialists*. Both the Tester Course offered in July at the Foundation Lab and the Tester Course offered in August in Incline Village, Nevada have already been closed to new registrants due to the large numbers of early pre-registered attendees.

Due to the large demand for attendance at the Foundation Training Courses, additional classes will be offered in 1993. Currently, the Foundation Staff is planning the dates and locations for training courses next year. The Foundation will continue to offer courses at the Foundation Lab and in Incline

Village, Nevada and will discuss the possibility of offering additional courses at other locations.

Because of the large numbers of early pre-registered attendees, it is suggested that those interested in the training courses contact the Foundation office three to four months in advance of the course in order to find out how much space is available. At this time, one will also determine how quickly an application and registration fees must be received by the Foundation to reserve a space in the course. For a complete listing of Training Courses offered by the Foundation, please see the Calendar of Events on the back cover or the course listings on page two.

Recently, the Foundation presented a two day seminar for the United States General Services

Administration in Atlanta, Georgia. The seminar informed many employees of Federal Buildings from the surrounding areas about the dangers of cross-connections and what can be done to prevent backflow. Additionally, the seminar guests were given ideas of what to look for in their daily surroundings and how to keep their properties safe from hazardous cross-connections. The seminar was very well received according to the planning officials. In addition to the Five Day Training Courses offered by the Foundation. Foundation personnel have been participating in these one and two day seminars in order to bring a general understanding of cross-connection control to all those involved in providing safe drinking water. If additional courses or training seminars are needed in your area, please contact the Foundation Office. 💧

Special Backflow Preventer Arrangements for Testers to Practice with

Testers who are preparing for recertification, or even testers who don't do much testing but want to keep their skills honed, often would like to practice testing backflow preventers. Test stands can easily be assembled in an area that allows for water drainage, such as a meter shop or outdoors. The only necessary components are a backflow preventer a hose connection, water supply and some sort of stand to hold the assembly in place. This type of set-up is easy to assemble and can be very helpful to the tester who doesn't get the necessary practice in the field, but would like to maintain his or her certification.

In addition to the simple set-up described above, it may be desirable to fabricate test assemblies which can be manipulated to simulate problems with the backflow preventers such as leaking check valves or leaking shut-off valves. This can be accomplished by attaching bypass piping into each chamber of the assembly with needle valves used to control the amount of water passing from one chamber to another. It is simple to use tees at the testcock locations to create bypasses across check valves and shut off valves.

For example, Figure 1 shows a double check valve assembly (DC) with tees off of the testcocks which can be used to create "leaks." To simulate a leak across the number

one shut-off valve the tester would need to open control needle valve #1 and control needle valve #2. (The control needle valve numbers used here correspond to the testcocks to which the control needle valves are attached, with the exception of the #5 control needle valve.) To simulate a leak across the

Figure 1

number one check valve the control needle valves #2 and #3 should be opened. Opening control needle valves #3 and #4 would simulate a leak across the number two check valve, while opening the #4 control needle valve and the #5 control needle valve would simulate a number two shut-off valve leak.

The situation would be similar for the reduced pressure principle assembly (RP). Figure 2 shows a slightly different set-up for the RP. As with the DC, opening the #2 and #3 control needle valves will simulate a leak across the number one check valve; opening the #3 and #4 control needle valves will simulate a leak across the number two check

valve; and, a number two shut-off valve leak may be simulated by opening the #4 and #5 control needle valves. It is not necessary to simulate a leak across the number one shut-off valve since this valve is never closed during the testing of the RP. Back-pressure conditions may be simulated by opening the upstream control needle valve (#1 for the DC and #2 for the RP) and the #5 control needle valve.

A similar set-up, with minor modifications can be used with the pressure vacuum breaker (PVB) to simulate a check valve leak and a number two shut-off valve leak. It would be necessary to install a tee in line upstream of the number one shut-off valve in order to simulate a number one shut-off valve leak.

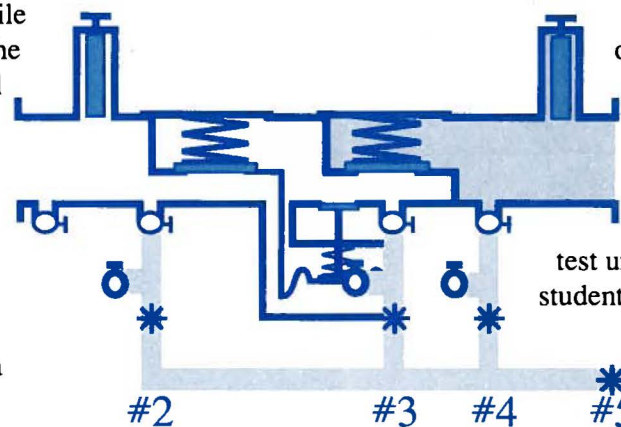


Figure 2

These types of arrangements have been very useful in the Foundation's Training Courses. These test units help the students to detect specific problems with the various

backflow preventers. The arrangements can be assembled quite easily with some basic plumbing materials. Those training facilities wishing to use such arrangements may wish to attach the bypass piping on the side opposite of the testcocks. This makes it easier on the novice who might become confused by all of the additional plumbing attached to the assemblies at the testcocks. 💧

Slide Presentation Package

Valuable Training Tool

The Foundation's new graphic slide presentation, *The Essentials of Cross-Connection Control*, has been available for approximately two months and has been received quite well within the industry.

This 35mm slide presentation package, which contains 60 color graphic slides, was created to explain and present the fundamentals of backflow prevention and cross-connection control. The presentation has many uses including: informing water safety officials, state, county and federal agencies as well as the general public about the dangers of cross-connections and what

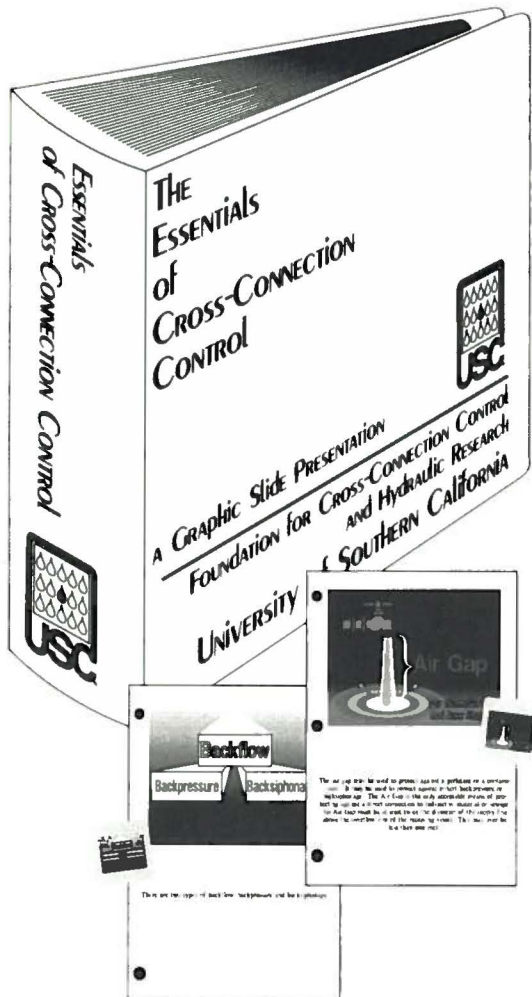
can be done to prevent backflow. The package has been especially helpful to cross-connection control and backflow assembly testing instructors and training facilities, according to the most recent feedback from purchasers of the package.

The slides cover some basic hydraulics, definitions of the various terms such as *Backflow*, *Backpressure*, *Backsiphonage*, *Cross-Connec-*

tion, etc. Generic graphics of each of the of the acceptable means of backflow prevention are shown (the air gap, the reduced pressure principle backflow preventer, the double check valve assembly, the pressure

vacuum breaker, and the atmospheric vacuum breaker). The applications of each of the backflow preventers is discussed as related to the hydraulic condition of the installation and the degree of hazard involved. Along with the 35mm slides, *The Essentials of Cross-Connection Control* includes a description of each slide,

along with a black and white representation of the slide. Each slide is represented on a different page. This allows the user to change the order of the presentation to suit his or her specific needs for the presentation at hand. Additionally, photographic slides may be inserted at various points to enhance the presentation of certain topics as they relate to the audience. 💧



Membership Survey

Earlier this year the Foundation Membership was sent a survey about the requirement for manufacturers to maintain spare parts. On the *List of Approved Backflow Prevention Assemblies*, many assemblies have the Greek letter psi (Ψ) next to the model number of the assembly. The Ψ designation means that the assembly is no longer manufactured, but the manufacturer can provide original manufacturer spare parts. The questionnaire was designed to find out what Members consider to be "Spare Parts." Should "Spare Parts" mean: elastomer (rubber) discs; O-rings and gaskets (all); seats (if replaceable); springs, spring retainers, disc retainers; cover plates; or, control piping.

With Approximately fifty percent of the Membership responding, fifty-one percent of those indicated that they would like all parts to be available if the assembly is listed as having spare parts available. Fourteen percent indicated everything except the control piping and cover plates should be available and another fourteen percent indicated that everything except the control piping should be available.

Another question posed to the Members was: how long should spare parts be available after the cessation of manufacturing a specific Model. Forty-six percent indicated that five years would be acceptable and thirty-six percent indicated ten years.

The Manual Review committee will be reviewing these results to determine spare parts requirements for the Ninth Edition. 💧

Calendar of Events

This calendar lists activities which the Foundation plans on participating in over the next few months. For more information contact the Foundation office.

8 July 1992 - Western States Symposium Association, Phoenix, AZ

15 July 1992 - Southern California Chapter ABPA Tester Update Seminar, San Diego, CA

13 - 17 July 1992 - Tester Short Course, Foundation Laboratory, Los Angeles, CA (**FULL**)

20 - 24 July 1992 - Program Specialist Course, USC Campus, Los Angeles, CA

3 - 7 August 1992 - Tester Short Course, Incline Village, NV (**FULL**)

12 August 1992 - Joint Instrumentation Conference, Santa Ana, CA

26 August 1992 - Northern California Backflow Prevention Association Annual Meeting, Pleasanton, CA

16 September 1992 - Inland Counties Water Association Update Seminar, Riverside, CA

24 September 1992 - Orange County Cross-Connection Control Group, Anaheim, CA

5 - 9 October 1992 - Tester Short Course, Foundation Laboratory, Los Angeles, CA

7 - 9 October 1992 - Ohio Chapter ABPA Annual Conference, Cleveland, OH



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