






## Frozen Shut Off Valves

The use of resilient seated shut off valves in approved backflow prevention assemblies has significantly improved the field testing of the assemblies. Having a tight shut off valve has made the job of the field tester considerably easier. Most of the manufacturers of the 2" and the smaller assemblies have selected the fully ported ball valves. These valves have shown themselves to be effective due to the good flow characteristics and also the effective shut off capabilities. However, there have been some reports of problems with these valves in actual use. The problem has not been directly with the sealing of the shut off valves, but rather with damage due to freezing on those shut off valves being used in cold climates. Freezing water inside the valves has damaged or destroyed the operation of the valve. Even with the winterizing of a water line, that is the water being drained out of the water line itself, the ball valves may be left in the fully opened or fully closed position. When this is done there is a small volume of water trapped between the outside of the ball and the body. With this trapped volume of water freezing the resulting damage can be significant. Seals or components may be distorted and in extreme cases the body housing itself could be cracked. As seen in the figure on page four, with the valve in the

open or closed position the small pocket of water is trapped in place.

Where winterizing of a water line is necessary it is highly recommended that the ball valve be left in a partially opened position. Leaving the valve at a 45 degree angle will leave this pocket unsealed and the trapping of water will be significantly reduced, thus eliminating any damage to the valve. Ideally backflow preventers on cold water applications should be kept in an area protected from the harsh environment. However, if the backflow preventer, including shut off valves, is installed in an unprotected cold weather situation the shut off valves should be left in a partially open position to prevent damage to the valves.

### Highlights

-  Relief Valve Opening Point of RP
-  New Members
-  Short Courses Scheduled
-  Foundation Office Prepares for Move
-  What is a Specialist?

## Film/Video

In the last issue of Cross Talk the production of the Film *Working Together for Safe Water* was announced. After much anticipation this film is now available in both 16mm and VHS formats. This film is designed to explain, in simple terms, the concepts of backflow prevention and cross-connection control. The narrator takes the viewer through the causes of backflow. In addition the operational characteristics of the various types of backflow preventers is explained using animation.

Many agencies and companies have already purchased copies of the film and the feedback has been very positive. Simplified language and animation help to express the difficult-to-explain concepts in terms that anyone can understand. This film has been used for various purposes such as: training courses, city/town council meetings, water customer education, and Saturday night home entertainment.

With an increasing number of entities worldwide becoming involved in cross-connection control, this film makes the task of education much more simple than it has been in the past. Members of the Foundation receive a 25% discount on the cost of the film and video. For more information please contact the Foundation office at (213) 743-2032.

## New Members

Foundation Membership has continued to grow at an accelerated rate. With this continued increase in the number of Members, the Foundation is able to offer more benefits to the Members. Listed below are the newest additions to the Foundation's Membership Program.

City of Altamonte Springs	General Motors Corporation	Parkersburg Plumbers Joint
American Water Works	Georgetown Municipal	Apprenticeship Committee
Service Company	Water & Sewer	City of Phoenix
City of Arvada	Village of Gurnee	Pike Plumbing Company
City of Athens	Hammond Valve Corporation	Placer County, CSA #21
B. F. Smith Mechanical	J. Noble Binns Plumbing Co.	R. L. Hardcastle Company
Bella Vista Water District	Kern Sprinkler Landscaping	Rancho California Water District
City of Cassville	Kerr Marketing Agency	Redlands Plumbing Company
City of Chandler	Leak Detectives	Richard Blake Backflow
Clean Water Backflow Service	City of Livermore	Testing & Repair
Clear Creek Community	City of Long Beach - Harbor Dept.	Robach, Inc.
Services District	City of Long Beach	South Coast Backflow Service
Collar, Williams, & White	Public Service	Taylor Plumbing, Inc.
Engineering	Madsen-Bayer and Associates	Tucson Water
Coronado Cays Homeowners	Malcolm Plumbing Company	City of Umatilla
Association	Monterey Bay Aquarium	University of California, Berkeley
City of El Centro	Normandy Village Utility Co.	Viking Mechanical Contractors
Foley Company	PSC Engineers & Consultants	W. E. Bragg Plumbing
Fort Wayne Backflow Prevention	Palm Beach County	Water Company of Florida
		Water Control International
		Water Specialties Company

## Notes of Interest:

Several notices have been sent to the Membership of the Foundation this year. These five notices 89-001 through 89-005, cover various topics such as: the use of improper testcocks on certain assemblies, defective material used on certain assemblies, the use of the Foundation's name in advertising and corrections for the latest "*List of Approved Backflow Prevention Assemblies.*" If the notices were not received or additional copies are necessary, please contact the Foundation office.

Many trade organizations allow their members to use the organization's logo on letterhead and business cards in order to show the member's affiliation and to advertise the trade organization. Some Members of the Foundation have asked if it is possible to use the Foundation's logo in this manner. The Foundation for Cross-Connection Control and Hydraulic Research is a part of the University of Southern California and therefore adheres to all policies of the University. One of these policies is that no entity other than the University itself use the logos and seals of the University. Therefore, the Foundation can not offer the use of its logo to the Members of the Foundation.



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## Has the Relief Valve Opened?

The testing of a reduced pressure principle backflow prevention assembly is a very straight forward task, as most experienced field testers will comment on. However, even the experienced testers may run into some problems that lead them astray. In some specific designs of RP's the relief valve's opening point may be misinterpreted. It has been found over the years, in some designs, a small volume inside the relief valve must fill with water before it spills out of the relief valve port and is physically detected by the tester. During the test the gage is manipulated to lower the differential across the first check valve. The tester will normally feel for the first drip of water from the relief valve with his or her hand while carefully watching the differential drop on the gage. However, in some models a hesitation may be noticed in the gage reading and then the tester may open the needle valve even further to get the differential to drop. If this is done the accuracy of the test may be adversely affected. The tester

may wonder why the gage needle is hesitating before it continues to drop. In certain RP designs, where a small volume must be filled with water before the first discernible drop appears, the relief valve actually opens at the point when the gage stabilizes. However, the tester has not visibly seen any water. Therefore the tester continues to open the needle valve even further driving the differential to a yet lower value. Once that volume in the relief valve fills with water and the water does begin to spill out of the discharge port, the tester then notes the reading on the gage. Should this reading drop below 2.0 psid the tester may actually fail the assembly even though the hesitation--which is the actual opening point of the relief valve--may have been well above the 2.0 psid requirement.

With some of the models it is advisable that the tester position their ear near the relief valve discharge port (being careful not to use the eardrum itself to detect the first drop of water) so that the

**Tester Course**  
8 - 12 January 1990  
and  
22 - 26 January 1990  
at  
The Foundation Laboratory

**Non-Members \$750.00**  
**Members \$600.00**

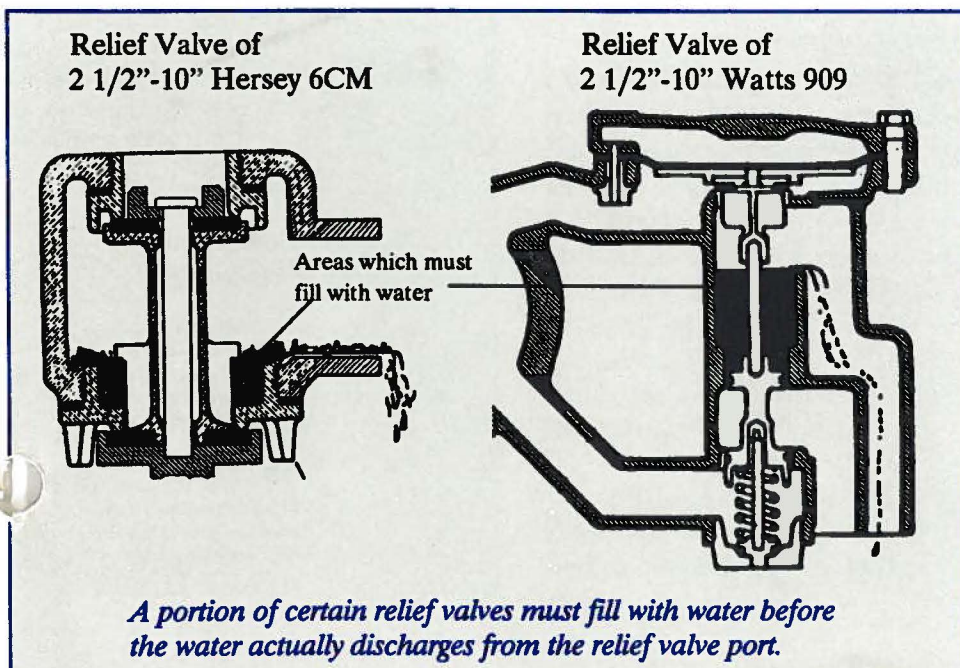
**Specialist Course**  
4 - 8 December 1989  
and  
14 - 18 May 1990  
at  
USC Campus

**Non-Members \$800.00**  
**Members \$640.00**

Contact the Foundation office for an application for the next USC Training Course or send a hard copy of a purchase order or a check to the Foundation office to reserve a space.

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audible hissing of the relief valve when it opens can be heard. In the figure shown below there is a cross sectional view of a Hersey model 6CM as well as a Watts model 909. In these cross sections the shaded area indicates the small volume that must be filled before water discharges through the relief valve port. The tester can actually hear the relief valve opening due to this hissing sound--this is the point that the tester must read the gage. If the gage is very slowly controlled the gage will not drop any further and the discharge will appear at the same value. However, if the tester is running the test too quickly the gage may drop beyond the correct value and may result in a failed field test. It is important that the field tester recognized these operating characteristics to assure that accurate test values are recorded.



## What is a Specialist?

The Foundation is often questioned about the difference between the Foundation's Tester Course and the Foundation's Specialist Course. Both Courses are Five-Day Short Courses and cover various aspects of cross-connection control. However, many people assume that, while the Tester Course covers the basic skills for testing and troubleshooting backflow prevention assemblies, the Specialist Course is simply a detailed version of the Tester Course--training the student to become a "Specialist Tester". However, this interpretation of the Specialist Course is not remotely correct.

The Specialist Course is designed to train a "Cross-Connection Control Program Specialist." This Specialist is trained to be the responsible party of an administrative authority covering cross-con-

nection control. The Specialist is taught about legal requirements, rules & regulations, policies & procedures, record keeping, public relations, site surveys, and other topics which will help him/her to organize, implement and maintain a defensible cross-connection control program.

Although it is highly recommended, it is not necessary that those attending the USC Program Specialist Course be Testers first. However, if the student is seeking Specialist Certification through the California/Nevada Section of the American Water Works Association, it is a requirement that the applicant hold a valid CA/NV Section AWWA Tester Certificate. For further information on either the Tester Short Course or the Program Specialist Course contact the Foundation Office at (213) 743-2032.

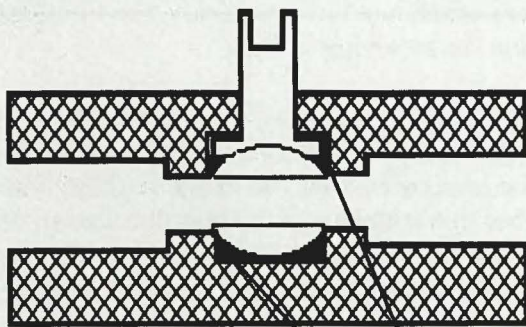
## New Office

The Office of the Foundation is currently located in Biegler Hall of Engineering. This building was constructed in the late 1930's as the University of Southern California's first Engineering Building. Since the Foundation falls under the auspices of the Department of Civil Engineering, the Foundation Office will move with the Civil Engineering Department into a new building during the last quarter of 1989. The new building, Kaprielian Hall, is currently under construction on the main campus of the University.

This move provides the opportunity for the Foundation Office to occupy larger quarters. Over the past three years the output of the Foundation has more than doubled. Thus, with more activity in the Foundation Office, space has been at a premium. The new office will provide more space for the Foundation, increasing the Foundation's efficiency.

Another change taking place is the change to a new University phone system. This new phone system will enable the Foundation to save on phone calls nationwide. The system will be a complete fiber optic system, thus increasing the quality and volume of calls made. The new phone system will be operational at the end of January 1990.

Members of the Foundation will be notified of the new address and phone number just prior to the cut-over dates. However, mail and phone calls will both be forwarded for a period of time, so there should be no interruption of service to the Members.



Black regions indicate trapped water.

*When a ball valves is left in the fully open or fully closed position there is a region of water trapped between the ball and the body. In cold climates, this water can freeze and cause damage to the ball valve. See article on page 1.*

## Who's Testing Backflow Preventers?

It has been reported that in some cases an apprentice or employee of a Certified Tester performs the actual field test of backflow prevention assemblies, while the person whose name actually appears on the certificate signs the field test form. A Certified Tester of backflow prevention assemblies is the only person who is allowed to sign the test forms for backflow preventers. This tester must also be the person who physically tests the assembly. It is not permissible for an apprentice to conduct the testing of the assemblies, bring the results to the Certified Tester and have the Tester sign the test form. The person who signs the test form must be the same person who actually conducts the test and holds the valid certificate. In fact, the person holding the valid certificate is the fully responsible and liable party, if they sign the test form. It is important

that testers be aware of these facts. Should there be employees or apprentices working for the Certified Tester and conducting the physical field test on backflow preventers, these apprentices and/or employees should be certified to test the assemblies.

Testers should also be sure that they are certified to test in the particular location in which the backflow preventer is located. Many administrative authorities having jurisdiction over backflow preventer testing may require that any tester under their jurisdiction be certified by them. Some testers believe that they are certified to test anywhere once they complete a training course. However, this is not the case. In most situations a tester may need to hold several valid tester certificates in order to cross various county or state lines to test.

### Manual

The Eighth Edition of the Manual of Cross-Connection Control is available for order. One complimentary copy was sent to each Member of the Foundation. Should additional copies of the Manual be required, Members are extended a 25% discount from the non-Member rate. Non-Members are extended a 20% discount on orders of 10 or more Manuals. The prices are as follows for each copy of the Manual.

Non-Member - \$37.00 each  
 Non-Member (in quantities of 10 or more) - \$29.60 each  
 Member - \$27.75 each

California residents must add appropriate sales tax. To order additional copies of the Manual please send a check or a hard copy of a purchase order to:

Foundation for Cross-Connection Control  
 and Hydraulic Research  
 University of Southern California  
 BHE-315 University Park MC-0231  
 Los Angeles, California 90089-0231

All Manual orders are processed within 3 days of receipt. There is an extra charge should UPS Blue Label, or Next Day Air shipment be required.

### Film/Video

*Working Together for Safe Water*

#### 16mm Film:

Non-Members \$200.00  
 Members \$150.00

#### VHS Video:

Non-Members \$80.00  
 Members \$60.00

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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### Ordering Materials from the Foundation

The Foundation requires that any orders be submitted with either a check for the full amount or a hard copy of a purchase order. In order to help those Members which need items quickly, the Foundation has available a FAX machine for receiving orders.

In many cases a Member may wish to order a **Manual of Cross-Connection Control** or a copy of the film/video *Working Together for Safe Water*, but it may be imperative that the order be filled immediately. Perhaps the Member needs to have a student enrolled in one of the Foundation's Training Courses, which have limited space. In any of these cases the Member's Purchase Order may be FAXed to the Foundation office and the order will be filled or registration confirmed immediately. Already many Members have taken advantage of the Foundation's FAX number in order to expedite their orders or registration. Members should feel free to use the Foundation's FAX line when time is of the essence. Orders received via FAX will be processed immediately. The Foundation's FAX number is (213) 743-0648.

For those orders which are not urgent, Members may simply mail their orders or registration forms to the Foundation office. All mail orders, whether for **Manuals**, or the film/video are processed within three days.

## Calendar of Events

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

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- 21 - 25 August** - Tester Course, Visalia, California.
- 13 September** - Inland Counties Updating Seminar, Riverside, California.
- 15 - 16 September** - Tri-State Seminar, Laughlin, Nevada.
- 21 September** - Southern California Water Utilities Association Vendor Fair, Walnut, California.
- 25 - 29 September** - Program Specialist Course, Dublin, California.
- 27 September** - Western States Symposium Association, San Diego, California.
- 24 - 26 October** - California/Nevada Section AWWA Fall Conference, Long Beach, California
- 8 November** - Western States Symposium Association, Sacramento, California.
- 18 November** - Trojan Football: USC vs. UCLA, Los Angeles, California.
- 4 - 8 December** - Program Specialist Course, USC Campus, Los Angeles, California.
- 8 - 12 January 1990** - Tester Course, Foundation Laboratory, Los Angeles, California
- 22 - 26 January 1990** - Tester Course, Foundation Laboratory, Los Angeles, California



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