Foundation for Cross-Connection Control and Hydraulic Research

USC

inside: **continuing education units/ swimming pools/ testing the svb... and more**

Cross Talk

Winter 2007

Swimming **Pool** fill **lines**

Swimming pools, spas, decorative foundations and even fishponds are all sites where common backflow issues occur. For the purposes of this article the term, "pool" will be used, even though the concepts should apply to any of these uses.

Public Swimming Pool

A water line is used to fill the pool, or as a water make-up line to make-up for evaporation and loss of water through splashing. However, the level of backflow protection may not always be consistent.

Since a pool is open to the atmosphere, and the potential for contamination evident, it must be considered a health hazard. It is true that some swimming pools are kept very clean and the water is tested regularly. However, the quality of this water is not on the same level as drinking water.

Additionally, administrative authorities do not want to allow water back into their system that has not been under their sanitary control. Some pools can become very unsanitary through lack of maintenance; additionally fishponds will contain animal waste. Since pools and the like are considered to constitute a health hazard; we know what level or protection is acceptable. An air gap, reduced pressure principle assembly (RP), pressure vacuum breaker assembly (PVB),

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School of Engineering
Celebrating 10^2 Years

Foundation Membership

The Foundation's Membership Program provides many benefits to the Members of the Foundation. These include: a twenty-five percent discount on manuals, twenty percent discount on Foundation Training Courses for any employee of the Member company/organization, the *List of Approved Backflow Prevention Assemblies*, printed quarterly, and access to the up-to-the-minute version of the *List* for those Members with Internet access.

Members are encouraged to call the Foundation with technical questions. The Foundation's Engineering Staff is available to assist members with the various aspects of field testing backflow preventers, installing backflow preventers and administering their cross-connection control program.

Below is a list of those who have become Members of the Foundation this past quarter:

ACCU Construction

Town of Addison, Texas

Advanced Hydonics

All Star Professional Training, Inc.

Backflow Engineering Group, Inc.

Callayomi County Water District

Charlotte County Utilities

Corporate Destination Services

Deetz, Inc.

Earth Tech, Inc.

City of Elizabethton

Flamingo Plumbing

Fennema Engineers

Guerrero Construction

Hayward Industries

City of Hendersonville

Highlander Backflow

IBIS

City of Keene

Kentucky Community & Technical

Kitsap Backflow

Kramer Construction

Lakeview Plumbing Co.

Leo's Electric and Plumbing Service

Massey Johnson

City of Montrose

Otay Water District

P&M Plumbing

Padre Dam MWD

Peabody Western Coal Co.

Plumbers Training Center

City of Redlands

Riverbank Public Works

City of Roseville

City of Santa Barbara

Shasta Lake, City of

Stoven Construction, Inc.

Tetra Tech, Inc.

Vic's Plumbing Co.

VIS

West Kern Water District

Cross Talk is published by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California for Foundation Members. Limited additional copies are available to Members upon request.

CEU's & Foundation **Training** Courses

The Foundation, on a regular basis, receives inquires about the Continuing Education Units (CEU's) it offers for its training courses.

The Foundation offers *The Course for the Training of Backflow Prevention Assembly Testers* and *The Course for the Training of Cross-Connection Control Program Specialists*. The Tester course provides instruction for those individuals who wish to learn how to test the various backflow prevention assemblies. And, the Program Specialist course specializes on explaining the intricacies of administrating a cross-connection control program; for example, determining where backflow preventers are necessary to protect the potable water system. All attendees of the five-day courses are given credit for a certain amount of CEU's.

Any student who attends the five-day Tester course is granted 3.0 CEU's or 30 contact hours. Students attending the five-day Program Specialist course are granted 3.5 CEU's or 35 contact hours.

The Foundation has been granting CEU certificates for over ten years. The number of CEU's for the Tester course has been revised in recent years from 2.4 to 3.0 CEU's.

The Foundation establishes the contact hours upon the International Association for Continuing Education and Training (IACET) Criteria and Guidelines for CEU's (Guidelines can be found on the IACET website, http://www.iacet.org). The guidelines identify what activities may be counted into the total contact hours and those that may not. Additionally, attendance for all technical session must be recorded with daily sign-in sheets.

Course for the Training of Cross-Connection Control Program Specialists

The Foundation regularly receives requests from former students asking for either a faxed letter or a certificate stating the amount of CEU's earned at the course. Former students make these types of requests for several reasons; one may include fulfilling a requirement to maintain a certification. Former students are welcomed to inquire about the CEU's and if a certificate is requested one can be made available for a nominal fee. Students are asked to contact the Foundation office for more information.

Unfortunately, many former students believe that an 8-hour a day five-day course would grant them 4.0 CEU's or 40 contact hours but this is incorrect. According to the guidelines set forth by the IACET the Foundation can only grant the above-mentioned CEU's for the respective courses. ■

Course for the Training of Backflow Prevention Assembly Testers

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spill-resistant vacuum breaker assembly (SVB) or an atmospheric vacuum breaker assembly (AVB) would all provide adequate protection, but they will not all work under the same hydraulic conditions.

For many uses the air gap is impractical, but under these circumstances, the air gap has its place. If the water make-up line is feeding into the main reservoir of the pool, it is possible to use an air gap to protect the potable water supply. Depending upon the circumstances, this can be very practical. For pools with diving boards, the air gap line can be installed under the diving board, where it is out of the way and easy to have a proper air gap. However, most public swimming pools have been removing their diving boards for safety and liability reasons, and the once well protected air gap becomes exposed.

An atmospheric vacuum breaker may be used with a submerged inlet as long as there are no shutoff valves downstream and the AVB is installed at least 6-inches above the overflow rim of the pool. This is ideal when there is a fill line below the rim of the pool.

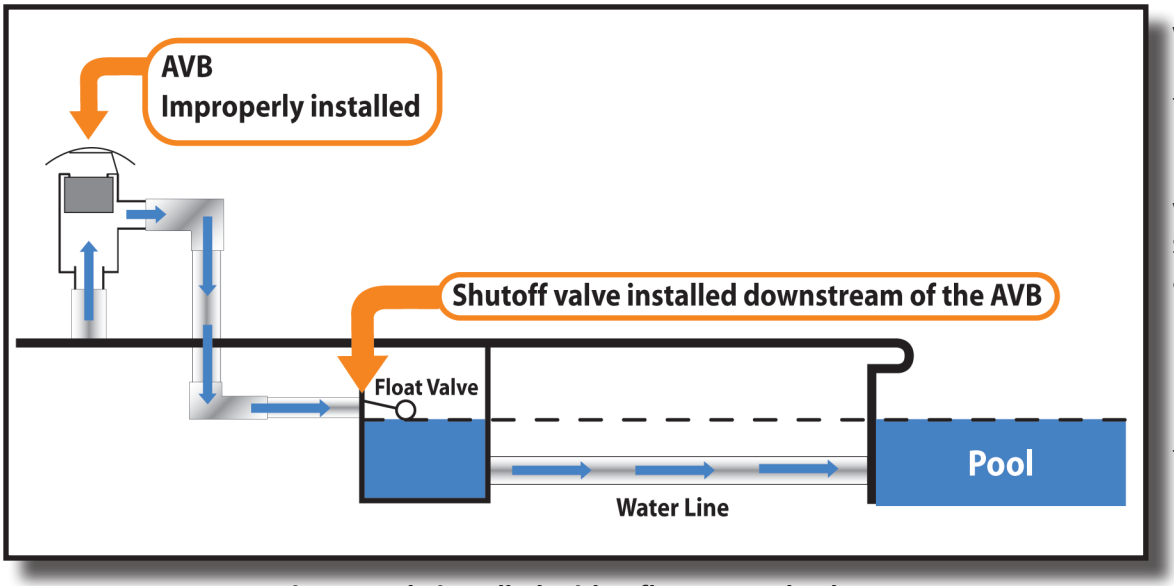
The AVB cannot be used when backpressure is present, nor may it be used under continuous pressure. So that the pool doesn't have to be filled manually, a common problem is created when the fill line is plumbed with

Pad where diving board used to be located. Air gap has been eliminated

an automatic float control valve. The float control valve will be placed in a location so that it can sense the water level in the pool, however, this is usually downstream of the AVB. The AVB will be kept under continuous pressure.

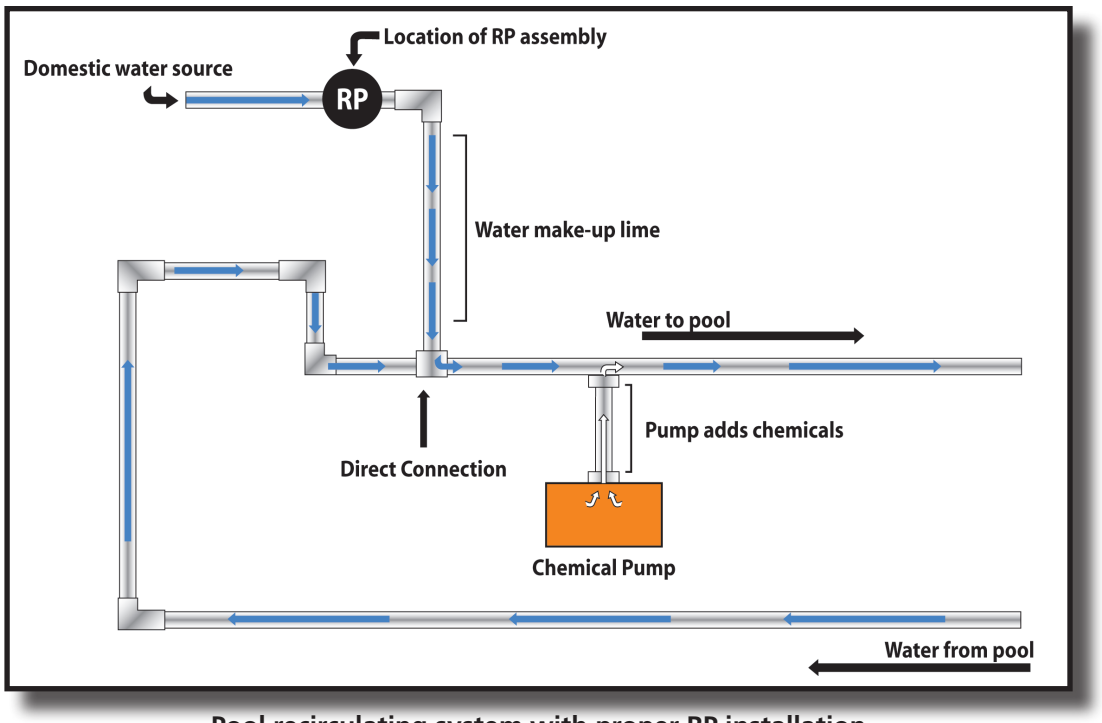
For this situation, it can be simply corrected by replacing the AVB with a PVB or SVB. The PVB may be used when the assembly will be subject to continuous pressure. There may be shutoff valves downstream, but the assembly still may not be subject to backpressure.

In situations where backpressure may be present, it is necessary to install a reduced



An AVB improperly installed with a float control valve system

pressure principle assembly. This may be the case when there is a recirculating system to supply a pool, waterfall, or fountain, and the water makeup line is directly connected to the recirculating system. In some larger pools, the pool chemicals are not manually added to the pool water, but rather, are injected or aspirated into the recirculating system. It would be necessary to use an RP when there is a water makeup line that is subject to backpressure.



Pool recirculating system with proper RP installation

To summarize, these pool type systems should be considered a health hazard as mentioned previously. Then, as with any system, a pool, spa, fountain, or fishpond, must be evaluated to determine if the cross-connection is subject to backpressure, or backsiphonage only. If the potable water line is subject to backpressure, an RP must be used. If not a vacuum breaker may be used. If the system is under continuous pressure a PVB, or SVB may be used; if under non-continuous use an AVB will provide the protection needed.

Top view of fishpond with hidden float control system

Swimming Pool: View of automatic float control valve

It is necessary with any of the assemblies to ensure that the assembly is installed properly. If these guidelines are followed, proper protection will be provided. ■

Complaint Process

Feedback from members and the general public are a crucial part in helping the Foundation keep on top of any issues or problems that need to be addressed regarding approved backflow prevention assemblies. The Foundation will occasionally receive a complaint about a backflow preventer and it is the Foundation's responsibility to follow through and investigate the complaint.

Foundation Laboratory

The Foundation receives complaints that vary from the aesthetics to the inner workings of a backflow prevention assembly. Once the complaint is brought to the attention of the Foundation, via e-mail, phone or in person, the Foundation staff notes the complaint for further investigation. It is at this point that it is crucial for the person making the complaint to give as much detail and information to the Foundation as possible in order to recreate the condition or investigate other similar situations.

Foundation Laboratory

It is recommended that a detailed report of the problem be included, documenting the complaint, and the following information be noted to help aid the Foundation staff in their assessment: the affected assembly model and size along with the use of the assembly and some indication of flow conditions under which the assembly is operating. Additionally, any photographs that depict the problem are very helpful. All this information will help the Foundation staff determine if a problem does exist. If samples are available contact the Foundation Office for shipping instructions.

The Foundation is open to hear any complaints that are made but bear in mind when more information and samples are provided it is more likely that the complaint will be investigated thoroughly. It is of extreme importance that the Foundation staff be given every piece of information available. If the conclusion of the investigation indicates that the complaint is valid the Foundation will take the appropriate steps to contact the manufacturer and in some cases issue a Special Notice to make members of the Foundation aware of the problem.

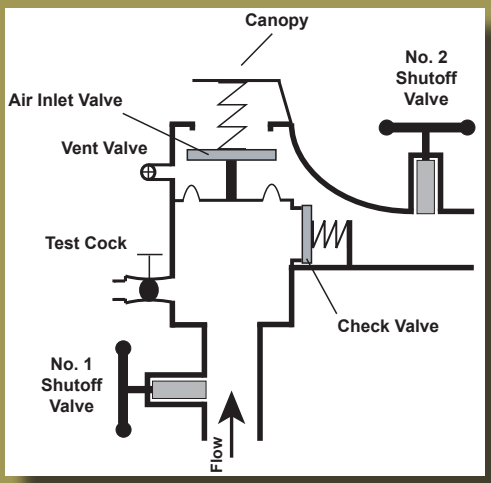
Those who wish to file a complaint about backflow prevention assemblies are encouraged to contact the Foundation office. ■

Field Testing the SVB

In order to field test the air inlet valve of the spill-resistent pressure vacuum breaker (SVB), the *Manual of Cross-Connection Control, Ninth Edition* states that the tester should, "open vent valve to lower outlet pressure to atmospheric." This has been interpreted in different ways. Some have concluded that the vent valve should be completely removed from the body of the assembly in order to lower the outlet pressure to atmospheric.

The same situation occurs while testing the check valve of the SVB. The field test procedure reads, "Open the vent valve. The water in the body will drain out through the vent valve."

The vent valve of a SVB is not the same as the fully ported resilient seated test cock. The vent valve used in most designs is a machine screw with an O-ring seal under the head of the screw. Loosening the vent valve will allow water to pass along the threads of the machine screw, but the passageway is very restricted. So the water exiting the vent valve will flow very slowly.



Spill-Resistant Vacuum Breaker (SVB)

It has been reported that some testers undergoing an examination, which uses the Ninth Edition field test procedures, have been failed for completely removing the vent valve. Other testers have reported that they have been failed for not removing the vent valve completely.

The text of the Manual does not specify whether or not the vent valve should be completely removed. However, it is clear that the pressure needs to be reduced to atmospheric in the body. If one "cracks open" the vent valve and allows water to drip out of the vent valve opening, it is possible to reduced the pressure in the body to atmospheric, or to drain the water from the body. However, dropping the pressure to atmospheric will take place much more quickly should the vent valve be completely removed. Additionally, if one drains the body of the assembly by "cracking open" the vent valve, the body will typically drain by dripping slowly from the vent valve. This will, not only take a long time, it will also be difficult to determine when the water in the assembly has been completely drained to the level of the vent valve.

It is the Foundation's recommendation that the vent valve be completely removed from the assembly during both the air inlet valve test as well as the check valve test. This will ensure that the pressure is drained all the way to atmospheric while testing the air inlet valve, and also that the body will be completely drained when obtaining the check valve reading. Care must be taken to lower the pressure in the body before completely removing the vent valve. Be careful not to drop or misplace the machine screw. ■

Orientation of Assemblies

The Foundation's policy is that assemblies are approved for installation in the orientation under which they were evaluated only. Installing an assembly in any other orientation other than the orientation(s) listed on the List of Approved Assemblies will invalidate the Foundation's Approval. Depending upon the type of assembly, there are several orientation possibilities.

Some have commented that the Foundation does not approve assemblies in certain orientations. Actually, the Foundation will approve an assembly in any orientation as long as the manufacturer requests it and the assembly successfully completes both the laboratory and field evaluation. ■

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Training Courses

Tester Course

Los Angeles, CA
8-12 January 2007

Los Angeles, CA
14-18 May 2007

Los Angeles, CA
9-13 July 2007

Specialist Course

Los Angeles, CA
22-26 January 2007

Los Angeles, CA
23-27 July 2007

Upcoming Events

Oregon Chapter ABPA- Annual Conference
Wilsonville, OR
18 January 2007

SRC4 14th Annual Conference
Spokane, WA
22 February 2007

ABPA Annual Conference and Tradeshow
Reno, NV
30 April- 2 May 2007

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