Foundation for Cross-Connection Control and Hydraulic Research
a Division of the University of Southern California

USC

inside: **laboratory & office open house | rp field test | the essentials... and more**

Cross Talk

Summer 2013

Are **Hydrants** a concern for **Cross-Connections?**

A fire hydrant is a common device found in any neighborhood. And, since the device is a source of water it is important to be aware of the potential for cross-connections.
To begin with there are two types of fire hydrants that are commonly used; a wet barrel hydrant and a dry barrel hydrant. A wet barrel hydrant is normally pressurized with water. And, a dry barrel hydrant is designed so that the barrel of the hydrant drains of water when the hydrant is closed.

When a wet barrel hydrant is used in the potable water supply; normal use of the fire hydrant should not present a cross-connection problem. But, when that private hydrant is used on a customer's property, a new set of factors may create other problems.

In the case of a private fire hydrant being used on a customer's property, it is not uncommon for the hydrant to be at the end of a long section of piping. This is done because fire-fighting capabilities are needed at a more remote location of the property. When this occurs, it is possible for the water in the leg of piping to become stagnant. When the piping is used exclusively for feeding the hydrant, then stagnating water is very likely to occur.

And, since stagnating water is likely present the administrative authority may assess this as another unprotected service connection, and may require a backflow preventer to feed that line. This protects the potable water supply

continued on **page 6**

Contents

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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, notifications of when the *List of Approved Backflow Prevention Assemblies* is updated on the USC Foundation's website.

Members are encouraged to call the USC Foundation with technical questions. The USC 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 USC Foundation since the last *Cross Talk*:

Apache Junction Water District
Assumption Parish Waterworks
Backflow Prevention Schools
Bass Fire Protection
Chris Castaing
Colorado Springs Utilities
CSA Group
Doug Rohl
Engineering Concepts, Inc.
Fisk Solutions Pte Ltd.
City of Glendale - Parks Division
Green Bull, LLC.
Irri-Care Plumbing & Backflow
Jensen Design & Survey
Keith Nava's Cross Connection Control
Marco De Leon Plumbing
Mesquite Mechanical
Restore Plumbing and Drain
Rick Eberle
Russo Construction Company
City of Venice - Utilities Department
Washoe County School District
William Cullian

Cross Talk is published by the Foundation for Cross-Connection Control and Hydraulic Research, a Division of the University of Southern California, for Foundation Members.

Laboratory **Open House**

In June the USC Foundation laboratory opened its doors to the Southern California Water Utilities Association (SCWUA) for a tour of its facilities. Working with the SCWUA, the USC Foundation staff welcomed water personnel from southern California to demonstrate the several types of tests done at the USC Foundation laboratory.

The USC Foundation has had a relationship with the SCWUA since the 1960's. The SCWUA is made up of public and private water utilities throughout southern California. In March 1967 the Board of Directors of the SCWUA presented USC with a $10,000 check. The SCWUA check helped setup the USC Foundation membership program.

After a brief introduction, SCWUA members were given a tour of the USC Foundation laboratory. The tour, given by USC Foundation staff, consisted of stops at different stations. SCWUA members were shown different steps in the approval process.

SCWUA members were given demonstrations of backflow prevention assemblies on the different sized cycle systems, flow test lines and vacuum test systems. Aside from test demonstrations, USC Foundation staff explained its data acquisition process that includes measuring hardness of elastomers and springs.

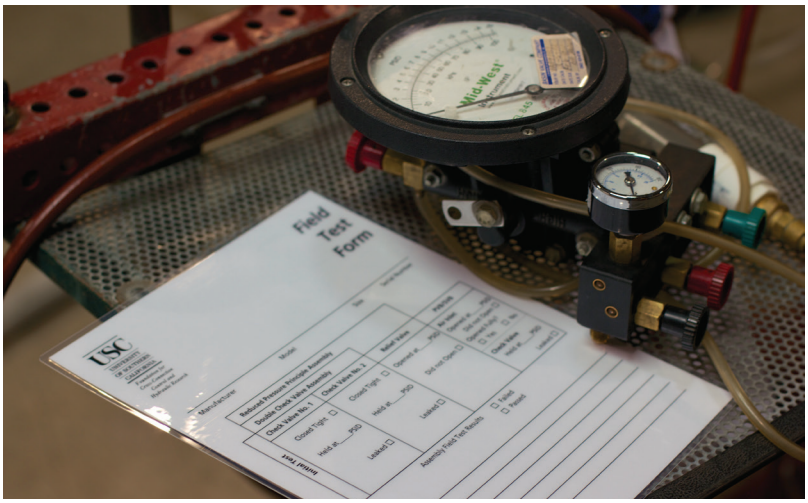
After the demonstrations, USC Foundation Director J.J. Lee and Foundation Chief Engineer Paul Schwartz provided SCWUA members with brief overview presentations about the USC Foundation.

The USC Foundation hopes that the tour helped SCWUA members better understand the rigorous tests conducted on each backflow prevention assembly before being granted approval and added to the USC Foundation List of Approved Backflow Prevention Assemblies. If any other groups are interested in a taking a tour of the USC Foundation laboratory please contact the USC Foundation office for more information. ■

About the **RP Field Test**

The reduced pressure principle backflow prevention assembly (RP) may be the most complex of the backflow prevention assemblies. And, from time to time the USC Foundation is asked to explain why certain decisions were made regarding the RP's field test procedure.

The 3.0 PSI buffer recommendation had become synonymous with the field test procedure on an RP. The recommendation was a part of the field test procedure for an RP in the Manual of Cross-Connection Control, Ninth Edition. But, the Tenth Edition of the manual eliminated the recommendation.



Many agencies took the Ninth Edition recommendation as a requirement and made it a requirement in order for assemblies to pass their field evaluation. Other agencies didn't see it as a requirement and didn't make the 3.0 PSI buffer a mandatory requirement.

During the discussions for the Tenth Edition, the Manual Review Committee agreed to eliminate the 3.0 PSI buffer recommendation from the field test procedure and with it any confusion that surrounded the "recommended requirement."

With the publication of the Tenth Edition, the 3.0 PSI buffer is no longer mentioned as part of the field testing of an RP.

To explain, the "buffer" is the difference in the readings of the differential pressure across the No. 1 check valve and the differential pressure at which the relief valve opens. For example, the first check reading on an RP is 5.7 PSID and the relief valve opens at 2.5 PSID; the buffer is the difference between the two readings, in this case 3.2 PSID. The buffer is to minimize the nuisance created by water discharging when there are line pressure fluctuations.

Since the buffer is not an indication of the backflow preventer's ability to prevent backflow, the Manual Review Committee decided to remove the recommendation during the field test procedure. However, all RP's are required to have a 3.0 PSID buffer during the laboratory and field evaluation phases of the approval process.

The Tenth Edition does, however, require the first check of the RP to hold at a value of 5.0 PSID or greater and it must also be at a value above the relief valve opening point.

One other step of the RP field test procedure that is regularly asked about is the lack of a numerical value requirement for the No. 2 check valve. The Tenth Edition field test procedure only requires the tester to note whether or not the No. 2 check valve "closed tight" against backpressure. The lack of a numerical value is what many testers question.

The Manual Review Committee decided that recording the No.2 check valve's numerical value was not necessary to determine the assembly's ability to prevent backflow.

Currently, the field test procedure can handle a No.2 shutoff valve leak while still providing accurate field test results. The backpressure test on the No. 2 check valve, in the Tenth Edition,

provides the information needed to determine if the assembly is preventing backflow. The test provides accurate results, allowing for compensation of most leaks through the No. 2 shutoff valve. Attaining a numerical value would require the assembly to have a drip tight No. 2 shutoff valve.

The Manual Review Committee understands that some administrative authorities require a numerical value for the No. 2 check valve and so the Appendix portion of the Tenth Edition manual includes an optional direction of flow test.

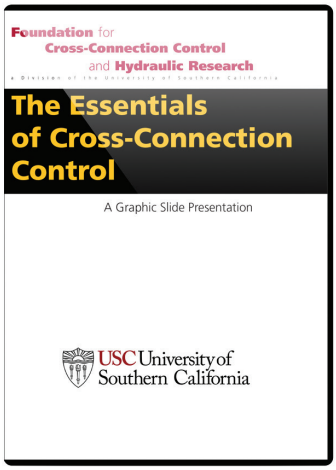
The No. 2 check valve direction of flow test may be found in chapter A.2.2 of the Tenth Edition. Again, it is important to note that a drip tight No. 2 shutoff valve is required to get an accurate value for this test. Any RP with a leaking No. 2 shutoff valve would automatically require the repair or replacement of the No. 2 shutoff valve before an accurate test on the No. 2 check valve could be performed.

The USC Foundation encourages anyone with questions about the field test procedures to contact the USC Foundation office. ■

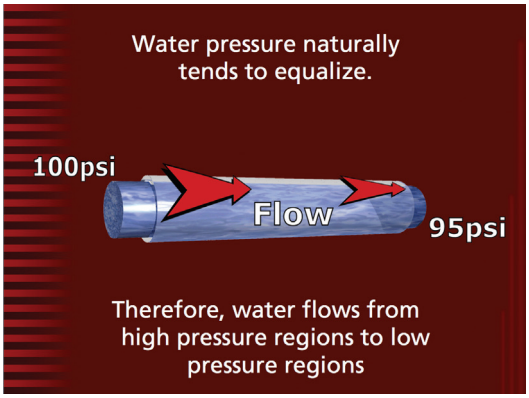
The Essentials

The Essentials of Cross-Connection Control Power Point Presentation was created to help those involved in cross-connection control to communicate the basic concepts of backflow prevention and cross-connection control to others.

The presentation contains 60 color graphic slides. The slides were created specifically to enhance the explanation and presentation of backflow and cross-connection control. Each slide consists of 3D graphics for a more detailed understanding of the concepts. The slides cover some basic hydraulics and definitions of the various terms such as backflow, backpressure, backsiphonage, cross-connection, etc.



Graphics of acceptable means of backflow prevention (air-gap, reduced pressure principle backflow assembly, double check valve assembly, pressure vacuum breaker assembly, and atmospheric vacuum breaker assembly) are shown rendered in 3-D for greater detail. The proper applications of each of the backflow preventers are shown as related to the hydraulic condition of the instal-



continued on **page 7**

continued from **page 1**

from the stagnant water and, since the water line is feeding the hydrant exclusively, there is no concern that the stagnant water would be consumed on the property (unless, of course, a cross-connection between the fire line and domestic line is created).

In most cases when a water line is used for fire-fighting purposes, the water supplier, does not meter the water. In which case, the water line would have to be used exclusively for fire-fighting purposes.

A dry barrel hydrant on the other hand creates a cross-connection as a result of normal use. A dry barrel hydrant is designed so that the barrel of the hydrant drains of water when the hydrant is closed. These are often used in areas that encounter freezing weather. Any water left in the hydrant may freeze during the winter causing damage to the hydrant.

When the water is shut off, it is shut off at the bottom of the barrel, which is underground below the freeze level. Then the barrel is drained of water. However, when the barrel is opened to drain, the hydrant is opened to the surrounding area, allowing any contamination to flow back into the hydrant, and the potable water supply. The concern is even greater when the groundwater levels are higher than the level of the drain. In that case, groundwater would be introduced into the potable water line. So, it is important for administrative authorities to be aware of how these hydrants work.

Since public fire hydrants are an accessible water source, many constructions sites use the water for construction purposes. Typically the administrative authorities will require a backflow preventer to be installed at the hydrant (along with a water meter). This will prevent any contaminants or pollutants from the construction site from getting into the potable water supply.

When backflow preventers are required on temporary services, there is the logistical problem of ensuring that they are working properly. Some regulations require that backflow preventers must be tested every time they are moved.

Title 17 of the State of California Code of Regulations, for example, states in Section 7605(d):

Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.

So water suppliers in California, for the most part, require that backflow preventers on temporary services be tested each time they are installed at a new location. This is to ensure the proper operation of the backflow prevention assembly each time it is put into use and in the case of California, in keeping with regulations.

continued on **page 7**

Office **Open House**

The USC Foundation hosted an open house of its new offices and training facilities for USC faculty and staff in August. Faculty and staff from around the University joined the USC Foundation in taking part in the open house.

USC staff were shown the USC Foundation's much larger office space along with its new training room. The USC Foundation plans on hosting training courses and one-day seminars in its new training room.

In addition to the walk through the new offices, guests were treated to a lunch and a brief introduction, by USC Foundation director J.J. Lee, of the USC Foundation history and current activities.

USC Viterbi Civil and Environmental Engineering Staff with USC Foundation Staff

Also, guests were shown a short slideshow presentation that highlighted the USC Foundation's history and ongoing activities. The slideshow presentation is available on the USC Foundation's YouTube Channel, which can be accessed by clicking the YouTube link found on the USC Foundation's homepage. ■

the essentials: continued

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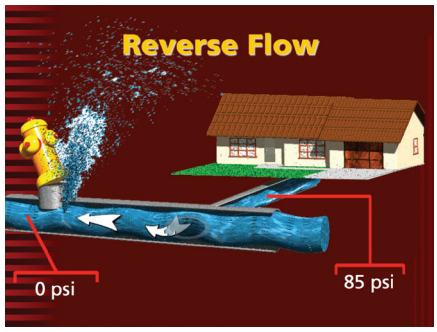
lation and the degree of hazard. A sample of the presentation may be viewed on the USC Foundation website (fccchr.usc.edu).



The Essentials slide presentation is a great tool to use for presentations in front of city and neighborhood councils, local community groups or any group that needs to understand the basic concepts of backflow prevention and cross-connection control. Those who purchase the Essentials slide presentation may customize it to their own particular needs. Individuals are welcome to present it without a need to contact the USC Foundation for permission.

The Essentials of Cross-Connection Control, Slide Presentation is available to USC Foundation members for $25.00. ■

hydrants: continued

continued from **page 6**

Water suppliers should consider hydrants in their water systems. Fire hydrants are very common and necessary, but some things need to be considered:

Are wet barrel fire hydrants used in a way that will allow contaminants into the potable water supply through the hydrant?

Are lines feeding a hydrant at the far end of a static pipeline protected using approved backflow preventers?

Are temporary use meters attached to fire hydrants protected with a backflow preventer? ■

Training Courses

Tester Course

Los Angeles, CA
6-10 January 2014

Los Angeles, CA
14-18 July 2014

Specialist Course

Los Angeles, CA
27-31 January 2014

Los Angeles, CA
28 July - 1 August 2014

One Day Seminar

TBA - Visit fccchr.usc.edu for dates

Social Media

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Upcoming Events

ABPA Tennessee
Chapter Conference
Chattanooga, TN
17-18 October 2013

ABPA Western Regional
Backflow Conference
Las Vegas, NV
28-30 October 2013

ABPA Hawaii
Chapter Conference
Honolulu, HI
13 November 2013

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