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Foundation for
Cross-Connection
Control and
Hydraulic Research

Direct vs. Indirect Cross-Connection

The Ninth Edition of the *Manual of Cross-Connection Control* defines a cross-connection as follows:

The term "cross-connection" shall mean any unprotected actual or potential connection or structural arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable system and any used water, industrial fluid, gas, or substance other than the intended potable water with which the system is supplied. Bypass arrangements, jumper connections, removable sections, swivel or change over devices and other temporary or permanent devices through which or because of which backflow can occur are considered to be cross connections.

- a. The term "direct cross-connection" shall mean a cross-connection which is subject to both backsiphonage and backpressure
- b. The term "indirect cross-connection" shall mean a cross-connection which is subject to backsiphonage only

Many people confuse the meaning of direct and indirect cross-connections with other aspects of plumbing. A common assumption is that a direct cross-connection is a connection that is permanently plumbed, whereas an indirect connection is a "removable" connection, such as a

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The AWWARF Research Project

As part of the American Water Works Association Research Foundation's project *National Assessment of the Impact of Cross-Connections in North American Water Supplies*, the Foundation Staff sent out over 4000 Surveys to water utilities across North America. Although some of the surveys are still trickling in, over 700 have been returned so far. The preliminary results have been tabulated at time of press. A summary of the findings to date (which included only about 170 of the surveys) was presented at the first workshop of the project, which took place on April 7th. The data presented was not conclusive due to the fact that only a small number of the surveys had been analyzed at that point in time. The data did, however, provide enough information to help guide the Foundation in a follow-up survey.

The workshop provided an avenue for many utilities to express what information they would like to see developed from the analysis of this survey and the future follow-up survey. The follow-up survey was prepared with the information obtained from the Workshop and the suggestions of the Project Advisory Committee of this AWWARF project. The follow-up survey has already been sent out and many of them have been completed and returned to the Foundation. It is expected to clarify some of the questions from the first survey and seek additional

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I n s i d e C r o s s T a l k

Updated Training Tools • Laboratory News
AWWARF Project • Training/Event Calendar



Foundation Membership

The Foundation's Membership Program continues to add new Members, we'd like to welcome the Members listed below.

Accurate Backflow Testing & Repair inc.
ACWA/Joint Powers Insurance Auth.
Advanced Plumbing
Alvin Morita
Avra Water Co-Op
B & B Plumbing
Backflow Assembly Testing & Supply
Backflow Express Cert Test & Serv
Backflow Prevention Systems, Inc.
Barstow Unfied School District
Brent Earley
Brownsville, City of
Brunswick & Topsham Water District
California City, City of
California State University - Chico
Chelan County PUD Water Department
Claremont Colleges
Classic Backflow Protection
Columbia Falls, City of
Commercial Fire Protection
Concho Rural Water Corp.
Coors Brewing Company
Corsicana, City of
Crucible Specialty Metals
Dames & Moore
David Herrmann
Department of Water Supply
Div. Of Capitol Facilities
Earth Tech
Environmental Care
Glenwood Landscapes & Design
Golden Environmental Management, Inc.
Greg House Backflow Service
Hamilton Western Utilities, Inc.
Hugh M. Cunningham, Inc.
In Depth Marketing
Integrity Backflow Company
Iowa Rural Water Association
Island Utility Services
J.A. Wax Co.
J.O. Mory, Inc.
Jamie Spicer
JATC - Plumbers & Pipefitters, NM
Johnson Controls
Joint Appren. & Training Trust
K.B. Backflow Inc.
Ken Russell Sprinkler Systems
Kimley-Horn and Assoc., Inc.
Law Engineering
Livermore, City of
Maverick Plumbing
McKinney, City of
McKinstry Company
McNeil Consumer Products Co. PR
Mississippi Potash Inc.
Morrison Supply Company
National Technology Transfer
Naval Facilities Eng. Comm., VA
Navy Public Works Ctr. Miramar
New Mexico State University
Nickels Plumbing
Okeechobee Utility Authority
Ozarks Technical Comm. College
P & B, Ltd.
P & N Enterprises
Palm Ranch Irrigation District
Pennsylvania Rural Water Assoc.
Peoria, City of
Pfeiffer Water
Prestige Plumbing Service
Pullman, City of
Quality Plumbing
Quartzsite, Town of
R. Lee Lawrence Backflow testing
R. Tsukushi Backflow Tester
R4 Enterprises, Inc.
RC Sales
Ridgeland, City of
River Palms Resort and Casino
Ryan Fire Protection, Inc.
Sandusky, City of
Santa Ana, City of
South Dakota Assoc. of Rural Water
Systems
Southaven, City of
SPB Utility Services, Inc.
Sprint
Tahoe City Public Utility District
Topsfield Water Dept.
Tukwila, City of
U.S. Coast Guard - San Diego
U.S. Navy
Vacaville, City of
Waverly, City of
Weldin Construction
Wichita PHCC
Wickenburg, Town of
Willing's Repair Service
Yarnell Water Improvement Assoc.

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Direct vs. Indirect Cross-Connection

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hose. If however, we go by the definitions above, this is clearly not the case. A hose connection, for example, could be plumbed directly from a hose bib to a hose connection used as a make up line on a boiler. If the pressure in the boiler is higher than the pressure in the supply the water could be backpressured through the hose. Because the connection is subjected to backpressure, it is considered a direct connection and therefore must be protected with the appropriate backflow preventer.

If, however, there is a permanently plumbed water line that drops into an open mixing tank, it would not

be a direct cross-connection. This would be permanently plumbed, yet it would not be a direct cross-connection because it would not be subject to backpressure.

Another common assumption is that an actual cross-connection is a direct cross-connection and a potential cross-connection is an indirect cross-connection. This is not true as shown with the example with the hose. Two hose bib connections may be near one another, with one connected to the potable water and one connected to a pressurized tank. Even though there may be no connection at the time the hose bibs are observed. However, once the hose connection is made between the two hose bibs, the cross-connection is subject to backpressure. And checking again with the definition of a cross-connection, a cross-connection is, *by definition*, either an actual or potential cross-connection. So, in this case, this hose bib would be considered a direct cross-connection since it may be subject to backpressure. From the other point of view, one may come across a fill like to an open mixing tank. This fill like could be fixed piping welded to the tank.

Although this is firmly plumbed as a submerged inlet, this would still be an indirect cross-connection. No matter what occurs, the supply line would only be subject to backsiphonage, not backpressure.



Contacting the Foundation

Mailing Address:

Foundation for Cross-Connection Control and Hydraulic Research
University of Southern California
Kaprielian Hall 200
Los Angeles, CA 90089-2531

Phone:

213 740 2032

FAX:

213 740 8399

e-mail:

fccchr@usc.edu

Web Site:

www.usc.edu/fccchr

The Foundation accepts Purchase Orders via mail or fax and credit card orders (Visa, MasterCard, Discover) via telephone and the Web.

It may simply be semantics, but it is important that all of those involved in cross-connection control understand one another as we work on the various aspects of our programs.

Updated Training Tools

All of the slides may be viewed on the Foundation's web page so Members can see exactly what they are getting before they order it.

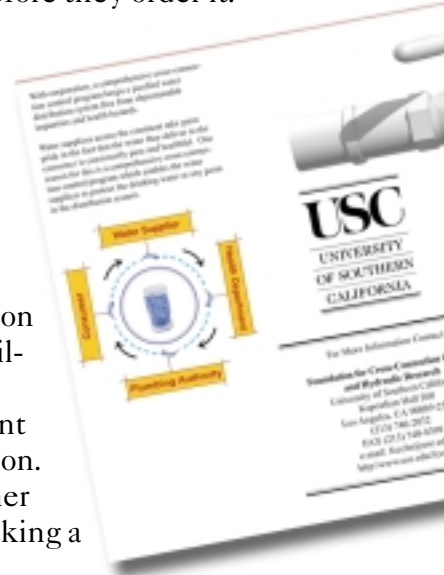
The Foundation staff is constantly looking for ways of serving its Membership better. As a result of this, two of the Foundation's training tools have recently been updated. The general brochure, Working Together for Safe Water has been redesigned. Although the general information remains the same, the graphics have been completely re-created and a few slight textural changes have been made as well. Members have been using the earlier version of this brochure for years to disseminate general information about cross-connection

control. The brochure works well as a mailer, or as a handout piece of literature.

The information contained in the brochure is designed to explain the basics of backflow and cross-connection control to those who have no knowledge of the subject. It can be used for customers, employees, various community associations, or anyone who needs to know this information. If you would like to see a sample of the brochure, please contact the Foundation Office and we'll get one out to you right away.

The Essentials of Cross-Connection Control is a 35mm slide presentation that has been available from the Foundation for the past few years. This last winter each of the slides was re-created using different computer software. Many of the graphics include 3D renderings of backflow preventers and plumbing systems. The new graphics move the presentation from a "cartoon" look to a much more professional look. All of the slides may be viewed on the Foundation's web page so Members can see exactly what they are getting before they order it.

In addition to the recreation of the graphics, the slide presentation is also available as a PowerPoint presentation. So, whether you're making a



Updated Training Tools

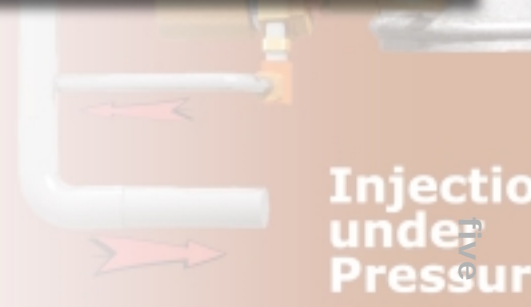
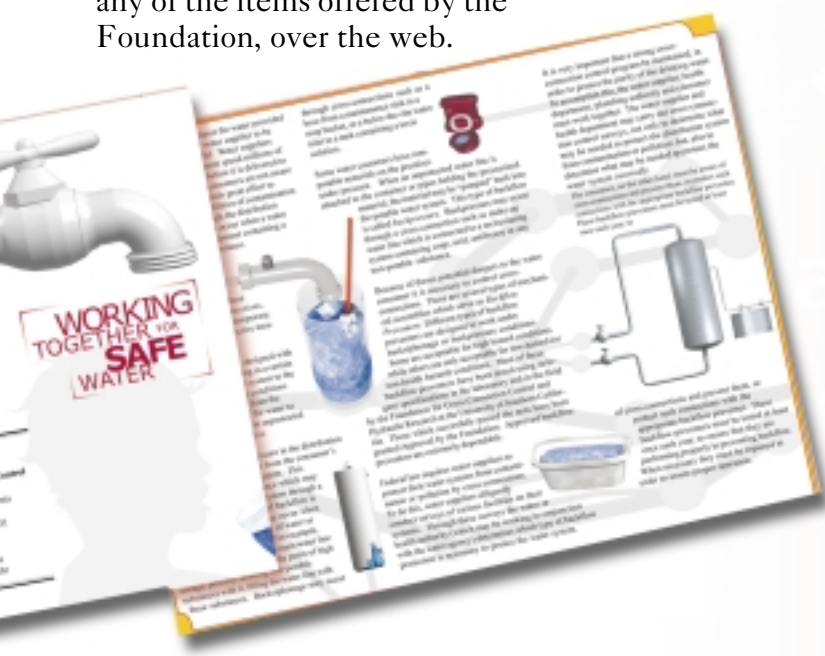
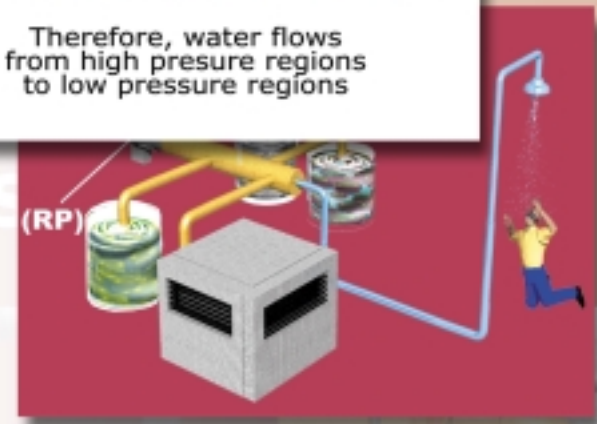
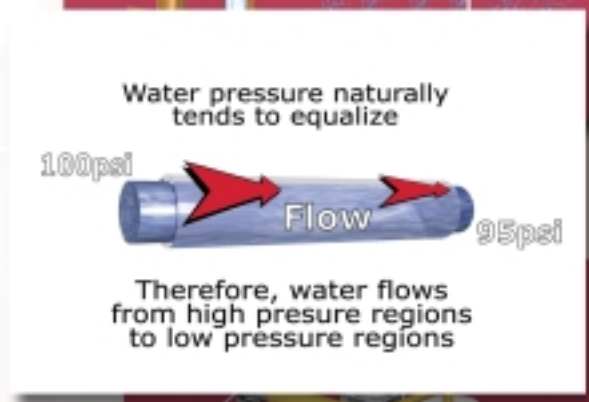
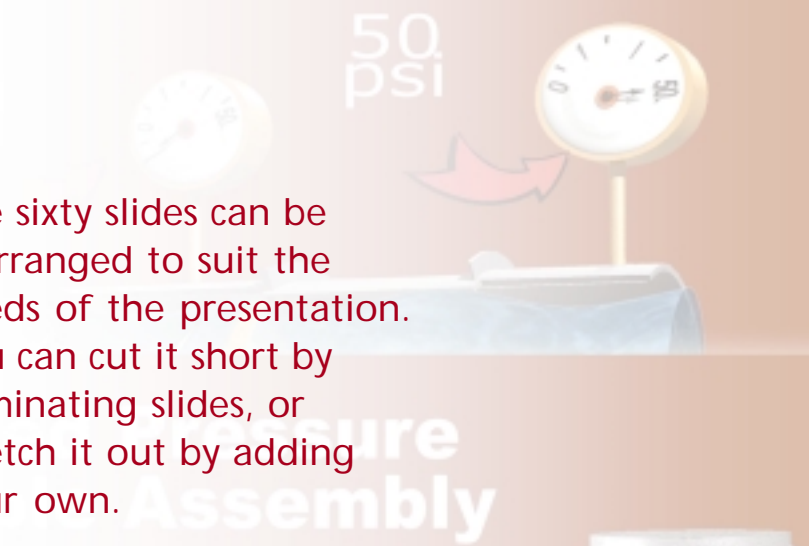
presentation with a 35mm projector, or a notebook computer with an LCD projector, this presentation is perfect for you. The sixty slides can be rearranged to suit the needs of the presentation. You can cut it short by eliminating slides, or stretch it out by adding your own.

The slide presentation comes with a three ring binder. A page for each slide includes an image of the slide and a brief description of what is shown in the slide. The PowerPoint presentation is available by request, but there is no extra charge for it. It is provided on a CD for computers running under Windows. A viewer is included, so MS PowerPoint is not necessary to view the slides.

The Foundation is always looking for new items that will help the Membership. If you have any suggestions for items you'd like to see the Foundation provide, please contact the Foundation office.

Make sure to visit the Foundation's secure server for ordering these, or any of the items offered by the Foundation, over the web.

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AWWARF Project

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information. It was not as long or involved, but more focused in order to bring out the details desired.

The Foundation office has been asked for details of the results obtained so far from the survey. It is important to realize that the information, which was provided at the April 7th workshop, was not complete. Approximately, one quarter of the total responses were tabulated at that point in time. So the information is far from conclusive. Additionally, the American Water Works Association Research Foundation sponsors this project, and the Foundation (at USC) cannot release the results directly. A final report will be available from AWWARF at the conclusion of the project. The USC Foundation will be making presentations on the project status throughout the continuation of the project, which is not scheduled to be published until 2002.

The Foundation will be making presentations throughout the project for those interested in keeping up-to-date with the project. The next update will be made at the Western Regional Backflow Conference in Las Vegas, Nevada. The conference will be held from October 2nd through the 4th at the Orleans Hotel and Casino.

For more information on this conference, contact Patti Fauver at (801) 536-4196 or Mike Moss at (801) 536-0089

The follow-up survey was sent to those who participated in the initial survey. If you participated in the initial survey, you should have received the follow-up already. If you have not received it, but did participate in the initial survey, you may download it from the Foundation's web site at: www.usc.edu/fccchr/awwarf/. The Foundation appreciates your participation in this project and we anticipate some very valuable information becoming available as a result of this project.

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AWWARF Project 2611 National Assessment of the Impact of Cross-Connections in North American Water Supplies **Follow-up Survey**

Please make any corrections necessary to this label.

National / Los

American Water

Please
and mail

Name _____

Company Name _____

Address _____

Cty. State Zip _____

Figure 1. 20 x 20 Pipe Network with 4

Figure 2. Variation of Pressure Head at Junction #10, #200 & #300

Figure 3. Pressure Head at Each Junction with Respective Pressure of #302 or #301 & #432

Who's New at the Lab?

The Foundation Laboratory had two new Engineering Technicians to help with the workload of the laboratory. Late last year and early this year two of the laboratory staff members moved on to other positions. This left a large void in the Foundation's workforce.

The Foundation's staff is very glad to welcome on board Troy Poole and David Ritz as the new Engineering Technicians. They will be performing much of the laboratory evaluation along with the current staff and the assistance of some student workers.

David holds a degree in Chemical Engineering from USC. He comes from an engineering company in the Los Angeles area, that manufactures automotive components. He was a quality inspector. He has other experience in quality engineering as well.

Troy Poole comes from a high tech firm in the Los Angeles Area. He was a customer service specialist and was involved in quality control as well as detailing the various aspects of production and testing. Of course with his name being Troy, he fits right in to the USC Trojan family!

The addition of Dave and Troy to the Foundation staff will help the current staff get a handle on the tremendous workload that the laboratory staff faces. Their experience in quality control and detailed record keeping make them naturals for the Foundation's lab work. Welcome Dave and Troy!



Dave

Troy
seven

Training Courses

Tester Course

Las Vegas, NV
16-21 October 2000

Charleston, SC
13-17 November 2000

Los Angeles, CA
8-12 January 2001

Los Angeles, CA
14-18 May 2001

Los Angeles, CA
9-13 July 2001

Specialist Course

Los Angeles, CA
11-15 September 2000

Los Angeles, CA
22-26 January 2001

Incline Village, NV
12-16 March 2001

Upcoming Events

Northern California Backflow
Prevention Association Fair
•Pleasanton, CA
7 September 2000

American Backflow Prevention
Association, Southern California
Meeting
•Garden Grove, CA
14 September 2000

Inland Counties Backflow Group
•San Bernardino, CA
20 September 2000

American Backflow Preventin
Association, National Meeting
•Vancouver, BC
22-24 September 2000

CA/NV Section AWWA Meeting
•Sacramento, CA
25-27 September 2000

Tri-State Conference
•Laughlin, NV
28-30 September 2000

Western Regional Backflow Con-
ference
•Las Vegas, NV
1-4 October 2000



**Foundation for Cross-Connection
Control and Hydraulic Research
School of Engineering**

University of Southern California
Kaprielian Hall 200
Los Angeles, California 90089-2531

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