

## Corrections to the "List"

The latest *List of Approved Backflow Prevention Assemblies* was issued on 23 November 1990. Certain items on the List are clarified and/or corrected to help the Members maintain an accurate List.

The Cla-Val Model RP-4V 4" reduced pressure principle backflow prevention assembly (which was added to page twelve of the List) was designed and tested for use in the vertical orientation as shown on the Approved List. It should be noted that this assembly may not be installed in the horizontal orientation. Should this be done, the Foundation's Approval would be invalid.

There are several corrections on page eleven of the List under the heading of Reduced Pressure Principle Detector Assemblies. The Ames Model 5000, both 6" and 8" should include the Neptune T-10 5/8" meter as an acceptable meter. This is listed as Meter M on the listing of meters included on page nine of the List.

All of the Watts Reduced Pressure Principle Detector Assemblies (Model 909 RPDA 3", 4", 6", 8", 10") listed on

*continued on page 4*

## Relief Valve Discharge Rates

When the installation of a backflow prevention assembly is required, the actual physical location of the assembly must be closely reviewed. The designer and installer have to recognize that the assembly must be readily accessible for testing and maintenance, as well as located where possible discharge from the assembly can be safely carried away. The vacuum breakers, both the atmospheric vacuum breaker (AVB) and pressure vacuum breaker (PVB), and the reduced pressure principle backflow prevention assembly (RP) may discharge water under certain operating conditions. The amount of discharge can be significant, especially from the differential pressure relief valve (RV) of the RP. Most of the manufacturers of backflow prevention assemblies have drain fittings which fit their respective assembly. However, these drain fittings are typically designed to handle only occasional spitting or small discharges (i.e., five gpm or less).

The Foundation is frequently asked about the discharge capacity of the various RP's. To provide designers and installers with some concrete data, the Foundation has performed some testing on several manufacturers; one-inch RP's. Two separate test conditions were performed to determine the greatest discharge rate capacity.

determine the result of a ruptured relief valve diaphragm. For each of the RP's tested, the diaphragm was cut in a 180° arc to simulate a totally ruptured diaphragm. Then for various supply line pressures, ranging from 25 - 150 psi, the amount of water discharging from the relief valve was measured.

The condition of the second test was achieved by removing the second check valves' moving components (i.e., poppet and spring), simulating a second check valve stuck in the fully open position. Then various backpressure conditions, ranging from 25 - 150 psi.,

*Continued on page 3*



The first test was performed to

# Welcome!<sup>2</sup>

## ...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.

Backflow Dynamics, Inc.  
City of Blythe  
Bud Davis Backhoe  
City of Coronado  
County Backflow Testing &  
Repair  
Cross-Tech  
Dames & Moore  
Esparto Community Services  
District

City of Folsom  
City of Fruitland Park  
Town of Granite Quarry  
City of Hanford  
Horticultural Resources  
Jet Landscaping  
City of Lewiston  
Leo Mathiasen  
McFarland Mutual Water  
Company

Montana Plumbing  
Murrieta County Water District  
Plumbing Industry  
Apprenticeship  
City of Providence  
Purdue University  
Reynolds Electrical  
& Engineering Co.  
Santa Clarita Water Company  
T & M Plumbing  
Toyo Valve Co., Ltd.  
Triangle Leahy Plumbing  
& Heating Corp.  
Dennis Turkish  
City of West Palm Beach

### *Tester Course*

**The Foundation Laboratory**

13 - 17 May 1991  
15 - 19 July 1991  
7 - 11 October 1991

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

### *Specialist Course*

**Las Vegas, NV**

10 - 14 June 1991

**USC Campus**

22 - 26 July 1991

**Atlanta, GA (tentative)**

25 - 29 March 1991

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

Courses will be added throughout the year as additions are made. Please contact the Foundation office for information on courses in your area. 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.

Foundation for Cross-Connection Control  
and Hydraulic Research  
University of Southern California  
KAP-200 University Park MC-2531  
Los Angeles, California 90089-2531

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

**USC**  
RECYCLED PAPER

*Cross Talk* is published by the University of Southern California's Foundation for Cross-Connection Control and Hydraulic Research for its Members. Additional Copies are available to the Members upon request. (213) 740-2032  
Copyright 1991 © University of Southern California.  
All rights reserved.

## "Approved" Gages

There has been recent confusion about the status of gage equipment used for testing backflow prevention assemblies. What is approved and what is not?

The Foundation does not currently maintain specifications for the gage equipment and, therefore, **CANNOT** issue approvals as for the backflow prevention assemblies. The Foundation has conducted reviews of the gage equipment to see if it complies with the generalized guidelines shown in Section 9 (Field Test Procedures) of the Foundation's Manual of Cross-Connection Control. The current gages that have been found to be acceptable for testing

### Differential Pressure Gage (for RP & PVB)

Barton 224  
Duke 75, 100, 1000  
Midwest 830  
ProMaster ASRP-4  
Watts TKDR, TKDP

### Duplex Pressure Gage (for DC)

Barton 100  
Duke 75, 100, 1000  
Midwest 890  
ProMaster ASDC-4  
Watts TKDR, TKDP  
Gage Heads available from several manufacturers (i.e., Ashcroft, Weiss gage, Weksler gage)

In preparation for the 9th Edition of the Foundation's Manual of Cross-Connection Control, the Manual Review Committee will be considering the establishment of design and performance criteria for gage equipment. This will probably encompass basic lay-out of the gages, accuracy requirements, and durability testing.

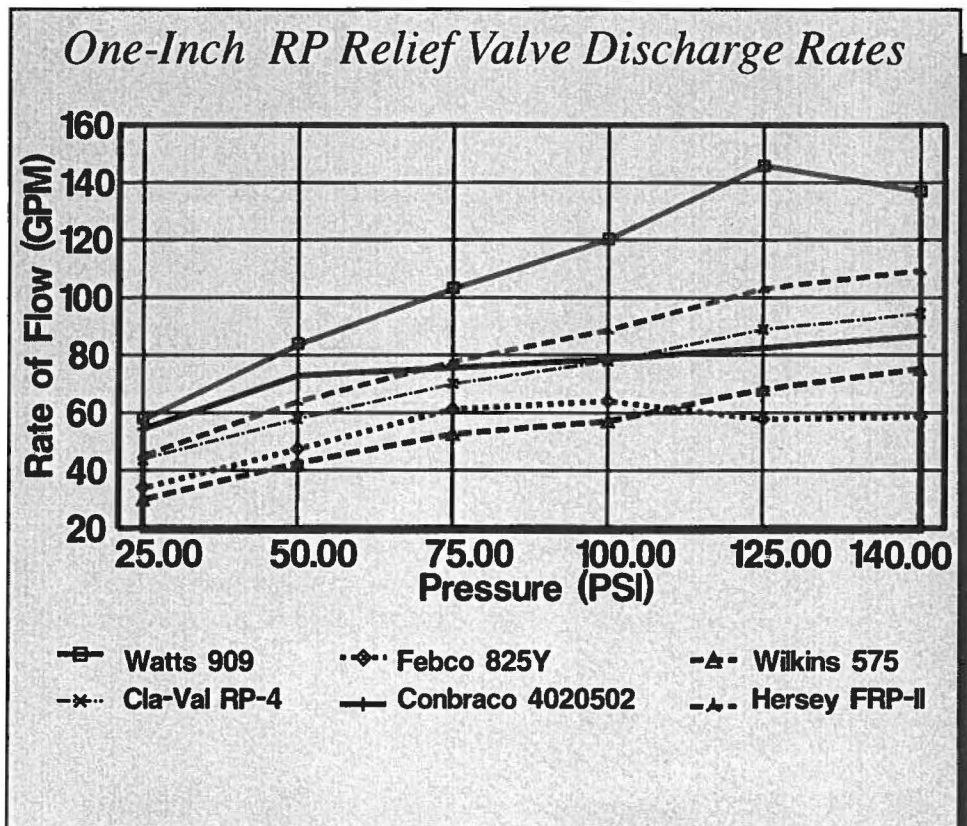
When the draft of the specifications has been completed by the Manual Review Committee, this draft will be circulated to the backflow prevention assembly and gage equipment manufacturers for comment. The Manual Review Committee will be diligently working on the 9th Edition through 1991.

## RV Discharge

*Continued from page 1*

were applied to the downstream side of the RP. This condition produced the higher dump rate values. These values are presented in the graph below. This worst case scenario gives designers and installers guidance when installing provisions for drainage around an assembly.

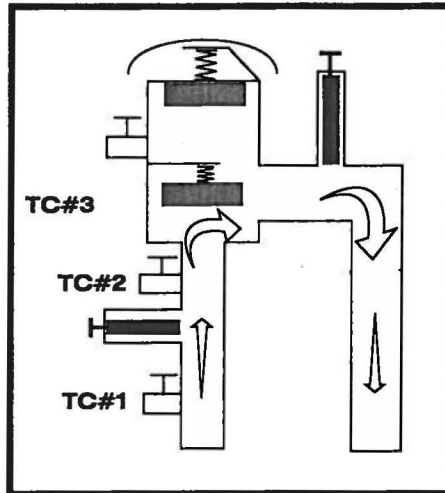
Note that these dump rates are in excess of the required dump rate capacity of five gpm detailed in the Foundation's Specifications (Table 10-4, **Manual of Cross-Connection Control - 8th Edition**) for 1-inch assemblies. This information is intended to assist those having to install RP's, and not to be use as a comparison between designs.



# Pressure Vacuum Breakers

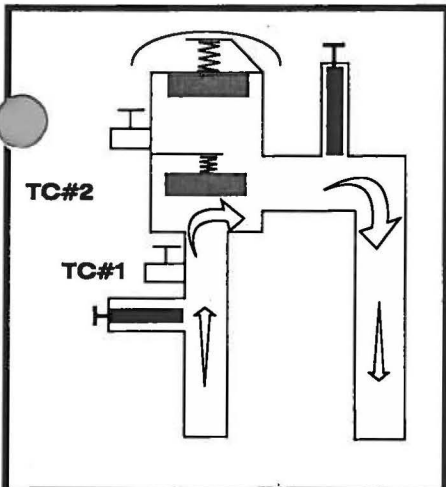
The use of pressure vacuum breakers has been quite extensive for many years. However, some areas are just now "discovering" how many they actually have in their jurisdiction. Once these units are located and documented to the record, there may be many questions that arise, but one of the more frequent is:

*Why do some of the PVB's have two testcocks while others have three?*



This question relates to a change that took place in the basic design of the PVB. All Foundation Approved PVB's up to about 1979 were required to have three testcocks, as shown in the figure above. Due to complete lack of use of the Number 1 Testcock during field test procedures, the specifications were modified in the Sixth Edition of the Foundation's Manual of Cross-Connection Control to require only two testcocks, as shown to the left.

In many old periodicals and pieces of technical literature you will see reference to three testcocks.



# List Corrections

*continued from page 1*

page eleven of the List should show the Badger Model 25 3/4" meter as the meter the assemblies were evaluated with. This meter is listed as meter O on the list on page nine. The letter O should appear in parenthesis after the model number and the letters N, and R should be included in the list of meters following the model number.

These corrections will be made on the next List of Approved Backflow Prevention Assemblies. Should you have any questions, or require further clarification, please contact the Foundation office at (213) 740-2032.

## Manual

The Eighth Edition of the Manual of Cross-Connection Control is available for order. 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  
KAP-200 University Park MC-2531  
Los Angeles, California 90089-2531

Manuals may also be ordered by sending a Purchase Order via FAX to the Foundation office. The Foundations FAX number is (213) 740-8399. 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.

## Working Together for Safe Water on Film/Video

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

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

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.

Foundation for Cross-Connection Control and Hydraulic Research  
University of Southern California  
KAP-200 University Park MC-2531  
Los Angeles, California 90089-2531

## Repairing the Wilkins 575 RP

The Wilkins Model 575 2 1/2", 3", 4", and 6" reduced pressure principle backflow prevention assemblies utilizes a part that most testers and repairers overlook. What appears to the casual observer as a surplus piece of piping is actually a vital component.

Located just ahead of the first check valve is a "pitot tube" which supplies water to the differential pressure relief valve (see below). A pitot tube is basically a tube facing the incoming flow of the water. The impinging flow of water will create a higher pressure at the opening of the pitot tube. Basic hydraulics explain this as a velocity head becoming a static head.

The pitot tube is needed in these units since the assembly's head loss characteristic dips, at mid to high range

flow rates, to a value near the relief valve's opening point. To keep the RV from opening during flows in this range, the pitot tube is utilized to transmit a higher pressure which is great enough to keep the RV closed.

Field personnel have had "unexplainable" RV discharge because they were not aware of the function of the pitot tube in these assemblies; the pitot tube was either damaged or missing altogether. This cannot be seen from the exterior of the unit, but the pitot tube is readily visible once the first check valve is removed from the body. One additional comment is offered: Make sure the open end of the pitot tube faces upstream. Should the pitot tube be installed out of position (i.e., facing the wrong way) it will not function as designed.

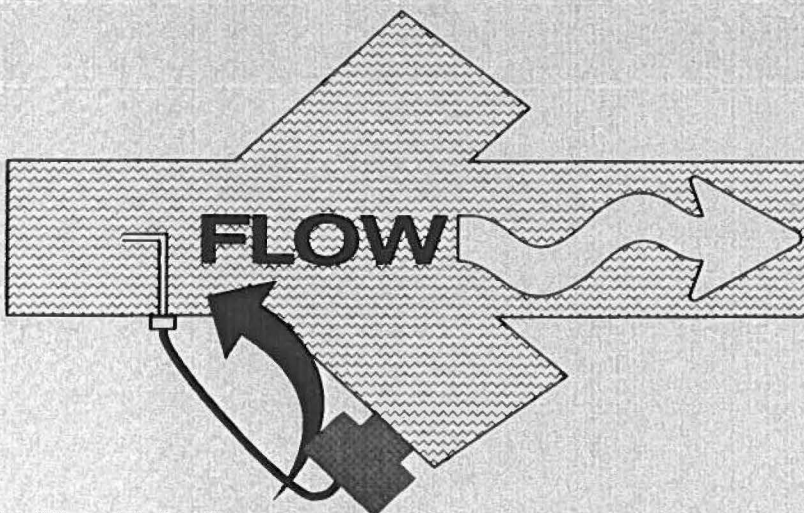
## Training Schedule Changes

In order to accommodate those Members desiring to participate in 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, the Foundation has re-scheduled several of the Short Courses for the next year.

The Tester Course will be offered five times in 1991 and the Specialist Course will be offered twice. The courses have been rearranged to allow students to take the tester course and, if desired, the Specialist Course immediately following. For those students applying for Certification through the CA/NV Section of the American Water Works Association it is required to hold a valid AWWA CA/NV Tester Certificate in order to apply for Specialist Certification. The rearranging of courses will allow students to obtain both in a relatively short period of time.

In addition to the changes in the Short Course Schedule, the Foundation will be increasing its courses offered at locations away from the Los Angeles area. The schedule shown on page 2 lists the courses in Los Angeles along with confirmed and tentative courses for other locations. To enroll or request further information on any of these courses, contact the Foundation office directly.

### *The Wilkins 575 RP Pitot Tube*



***The Pitot Tube faces into the oncoming water.***

## Calendar of Events

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

**7 - 11 January 1991**- Tester Short Course, Foundation Laboratory, Los Angeles, CA

**14 - 18 January 1991**- Tester Short Course, Foundation Laboratory, Los Angeles, CA

**23 January 1991** - Western States Symposium Association, Los Angeles, CA

**25 - 29 March 1991** - Program Specialist Course, Atlanta, GA (*tentative*)

**12 April 1991** - Presentation to Virginia Cross-Connection Control Association, Norfolk, VA

**22 - 24 April 1991** - Presentation at American Backflow Prevention Association National Conference  
Salt Lake City, UT

**13 - 17 May 1991** - Tester Short Course, Foundation Laboratory, Los Angeles, CA

**10 - 14 June 1991**- Program Specialist Course, Las Vegas, NV

**15 - 19 July 1991**- Tester Short Course, Foundation Laboratory, Los Angeles, CA

**22 -26 July 1991**- Program Specialist Course, USC Campus, Los Angeles, CA

**17 - 11 October 1991** - Tester Short Course, Foundation Laboratory, Los Angeles, CA

FOUNDATION FOR CROSS-CONNECTION CONTROL  
AND HYDRAULIC RESEARCH  
UNIVERSITY OF SOUTHERN CALIFORNIA

KAP-200 University Park MC-2531  
Los Angeles, California 90089-2531

First Class Mail  
U.S. Postage Paid  
University of  
Southern California

