10th Edition – Manual Review Committee
Responses to Comments on Section 10 Draft dated 12-1-05

The Manual Review Committee (MRC) met on 28 February 2006 at an Open MRC Meeting to review all written comments received on the draft Section 10 dated 12-1-05. Below are the MRC responses to each of the written comments. The responses are keyed (i.e., 2AV, 2F, 2MID, etc.) to the comment letters (attached).

Manufacturers
(AV) Apollo Valves (Conbraco)
(F) Febco
(FLO) Flomatic
(MID) Midwest Instruments
(WAT) Watts Regulator

Other Interested Parties
(R) Rand Engineering

Apollo Valves (Conbraco)

2AV1 – The modification of Section 10.2.2.3.8 – Backsiphonage/Backpressure Test (BPBS) was requested and presented to the Backflow Prevention Manufacturers Association (BPMA) in May 2000. No negative comments had been received until June 2005. The new protocol is more objective and will produce more repeatable results, since there is no placement of fouling wires which may shift during testing. The orifice sizes in the new protocol were adopted directly from the existing fouling wire. However, several of the comments received from manufacturers indicated that the increased flow rates, of both air and water, are 5 to 10 times as great as the flow rates produced during the current 9th Edition BPBS Test. These increased flow rates may prevent some existing RP's from complying with the test. It was pointed out that existing USC Approved products (i.e., 9th Edition and earlier editions) are not required to comply with the 10th Edition when it is published.

> Conclusion: Staff to solicit manufacturers to provide data on their own 9th Edition approved products. Manufacturers will be requested to perform flow rate tests with the appropriately sized fouling wire inserted per the current 9th Edition protocol. Then perform air flow tests at various vacuum levels, and perform water flow tests at various backpressure levels. This data should indicate what maximum flow rates are recorded, and at what pressure conditions. Due date of 1 April 2006.
>
> Staff to perform evaluation of 10th Edition draft protocol to determine what the critical parameters of the test are. Tests performed at lower flow rates may be investigated. Staff will then review their data, and the manufacturer's submitted data, and prepare a recommendation for MRC consideration.

2AV2 – The modification of Section 10.1.3.4 - Body and Cover materials The 1 December 2005 draft Section 10 contained the modification which would allow alloys containing less than 79% copper and/or more than 15% zinc, providing they comply with the ISO 6509

dezincification test. When the 1 December 2005 draft Section 10 was submitted for comments, several negative comments were received.

It was detailed that no data has been submitted that shows the depth of corrosion in the other materials is comparable to the current bronze alloys. There is little or no data from cross-connection control programs in other countries utilizing DZR materials in backflow preventers. It was suggested that there is a need for some correlation between laboratory dezincification data and field evaluation experience for future consideration. MRC members commented that relaxing the standard for materials may affect the longevity of the backflow prevention assemblies, and the end users of the products.

Conclusion: Motion passed to modify Sections 10.1.3.4, 10.1.3.5, 10.1.3.6, 10.1.3.8, 10.1.3.10, 10.1.3.17, 10.1.3.18 of the 1 December 2005 draft Section 10 as follows:

"…..which conforms to ASTM Designation: B61 or B62 or B584 UNS number C84400 or other bronze alloys that contain as least 79% copper and less than 15% zinc ~~Alloy containing less than 79% copper and/or more than 15% zinc shall be tested for dezincification resistance per ISO 6509 with a 200 micrometer maximum average depth penetration~~, or stainless steel……"

Febco

2F1 - see 2AV2

Flomatic

2 FLO1 – Table 10-2 - Markings. The request to add additional acceptable abbreviations to Table 10-2 was considered to be manufacture specific. Maintaining the current generic abbreviations would maintain a more uniform means of marking, benefiting the field personnel.

Conclusion: Non-persuasive, maintain current draft Table 10-2.

2FLO2 - Clerical error corrected.

2FLO3 – Section 10.1.2.17 marking requirements are separated between the different types of shutoff valves.

Conclusion: Non-persuasive, maintain current Section 10.1.2.17.

2FLO4 – Clerical error corrected.

2FLO5 – Clerical error corrected.

2FLO6 – Independence of Components. The failure mode criteria are identified in steps 'a' and 'b'. Proper operation of the check valves is determined by performing the static pressure drop test for the respective check valve.

Conclusion: Non-persuasive, maintain current draft of Section 10.2.2.3,x.

2FLO7 – Section 10.2.4.3.1.b indicates that the assembly is *isolated* from the pressure source, and this means that the applied pressure has been turned off and removed.

Conclusion: Maintain current draft of Section 10.2.4.3.1.

Mid-west Instruments

2MID1 – Section 10.4.1.1 Drawings and Specifications. Drawings are necessary so that the submitted product can be verified to be in compliance with material and design requirements. If requested, the University's General Counsel may sign a non-disclosure agreement with the manufacturer.

Conclusion: Maintain current draft Section 10.4.1.1.

2MID2 – Section 10.4.2.2.1 Accuracy Test. It was requested that the accuracy test be performed in the descending motion only, which normally relates to the way that readings are recorded in the field test procedures. If ascending points are to be tested, then they should be at critical points of failure (i.e., 1 psid, 2 psid, 5 psid) during the field test procedure. The MRC detailed that field test results are routinely observed and recorded in both descending and ascending modes. Critical points are not only limited to those mentioned above, but at values throughout the full scale. Administrative authorities maintaining field test results want to be assured that the data is accurate for all field test values.

Conclusion: Maintain current draft Section 10.4.2.2.1.

2MID3 – Clerical error corrected.

Watts Regulator Company

2WAT1 – see 2AV2

Rand Engineering

2R1 – see 2AV2

Comments Received
For
Section 10 – Draft 12-1-05

(8 pages)

Manufacturers
Apollo Valves (Conbraco)
Febco
Flomatic
Midwest Instruments
Wilkins

Other Interested Parties
Rand Engineering

(1)

"Apollo" Valves
Made In The USA

Date: January 9, 2006

Paul Schwartz, P.E.
Chief Engineer
Foundation for Cross Connection Control & Hydraulic Research
University of Southern California
Kaprielian Hall 200
Los Angeles, CA 90089-2531

RE: 10th Edition USC FCCC&HR Manual Draft dated 12-1-05

Dear Paul:

We have reviewed the USC FCCC&HR 10th Edition Manual draft dated 12-1-05. We have also reviewed the "responses to comments" on the draft dated 5-2-05.

Subject 1 – Response by Paul Schwartz

"AV1 – The modification of Section 10.2.2.3.8 – Backsiphonage/Backpressure Test was requested and accepted by the Backflow Prevention Manufacturers Association (BPMA). The new protocol is more objective...."

2AV1

We have reviewed the MRC meeting minutes published on the Foundation web site. The subject of an improved backsiphonage test goes back to 29 July 1997. This was indeed requested by the BPMA. However, the methodology that is now proposed (orifice plates) came years later by the USC lab as a result of testing that they had done. As far as we know, the manufacturers never recommended using wire sizes as orifice plates. Also, as far as we know, the manufacturers were never given the opportunity to review test data derived by USC.

We would like to see test data that was used to substantiate the methodology and (at USC's convenience) a demonstration of the proposed test.

Subject 2

Section 10.1.3.4 Body and Cover - *(typical material statement)*

2AV2

Alloys containing less than 79% copper and/or more than 15% zinc...with a 200 micrometer maximum average depth penetration;....

This value of 200 micrometers should be the same as the latest agreed upon AWWA C510 (C511) draft (July 2004) which is *100* micrometers.

Respectively,

Bob Funderburk
Lead Engineer – Backflow Products
843-672-1629

Paul H. Schwartz

From: Bill.Dunmire@processequipment.spx.com
Sent: Monday, January 09, 2006 7:12 AM
To: Paul H. Schwartz
Cc: John.Brewer@processequipment.spx.com
Subject: Re: FW: Draft Standard - USC Manual of Cross-Connection Control - 10th Edition

Paul, 2F1

I have one objection in the 10.1.3 Material Requirements section with the addition of copper alloys having more than 15% Zinc and testing for dezincification. Before I can agree with this relaxation of the maximum zinc percentage, I want to see some actual test results showing that the proposed ISO 6509 standard has some meaningful correlation to the current alloys and to acceptable field service. How does the corrosion rate listed correlate to actual field use?

Best regards,

Bill Dunmire
Chief Engineer
FEBCO - A Division of Watts Water Technologies, Inc.
1491 NC Hwy 20 West
Saint Pauls, NC 28384
Phone 910 865 6267
FAX 910 865 6220
bill.dunmire@processequipment.spx.com

"Paul H. Schwartz" <pschwart@usc.edu>

12/09/2005 02:46 PM

To "Paul H. Schwartz" <pschwart@usc.edu>
cc
Subject FW: Draft Standard - USC Manual of Cross-Connection Control - 10th Edition

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From: Paul H. Schwartz [mailto:pschwart@usc.edu]
Sent: Friday, December 09, 2005 11:26 AM
Subject: Draft Standard - USC Manual of Cross-Connection Control - 10th Edition

Attached are the following 10th Edition documents in pdf format.

1. Cover letter
2. Draft MRC 11-15-05 meeting synopsis
3. MRC Responses to comments on 5-2-05 draft of Section 10
4. Draft Section 10 - dated 12-1-05

We request that any comments, corrections, or suggestions regarding the proposed drafts be provided to the Foundation by 9 January 2006. Should you have any difficulty opening these files, please contact our office.

Happy Holidays,

FLOMATIC 3

Paul H. Schwartz

From: Chris Fitzgerald [chris@flomatic.com]
Sent: Monday, January 09, 2006 1:50 PM
To: 'Paul H. Schwartz'
Subject: RE: Draft Standard - USC Manual of Cross-Connection Control - 10th Edition

Dear Paul,

2 FLO

I have reviewed the 10th Edition – Section 10 and have the following comments:

1. Flomatic requests that DCVE, RPZE and PVBE be added to the list of acceptable markings in Table 10-2 on Page 4.
2. Page 8 – Sect. 10.1.2.7 Body and Bonnet – The words "In addition" can be removed because the prior paragraphs are being deleted.
3. Page 12 – Shutoff valve marking paragraph (a-d) appears to be redundant. It is not clear, but it appears that 1 is the requirement for C504 – Butterfly Valves and 1 is for C509 – Gate Valves.
4. Page 27 – Paragraph "L" should be paragraph "K".
5. Page 29 – Section 10.2.2.2 - The addition of "j" requires the renumbering of the remaining lab requirements.
6. Page 34 – Section 10.2.2.3.x – Paragraph "e" states rejection criteria implying that the valve is in a particular test setup. This test setup has not been described in this Section. Please clarify if the valve is still in the previous test setup for the static pressure drop across check valve test (Sect. 10.2.2.3.6).
7. Page 54 – Section 10.2.4.3.1 – Paragraph "b" – Is the pressure source removed in between closing test cock #2 (isolating the assembly from the pressure source) and opening test cock #2 to relieve pressure?

Please call if you have any questions.

Chris

From: Paul H. Schwartz [mailto:pschwart@usc.edu]
Sent: Friday, December 09, 2005 2:26 PM
To: Paul H. Schwartz
Subject: Draft Standard - USC Manual of Cross-Connection Control - 10th Edition

Attached are the following 10th Edition documents in pdf format.

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We request that any comments, corrections, or suggestions regarding the proposed drafts be provided to the Foundation by 9 January 2006. Should you have any difficulty opening these files, please contact our office.

Happy Holidays,

Paul H. Schwartz, P.E.
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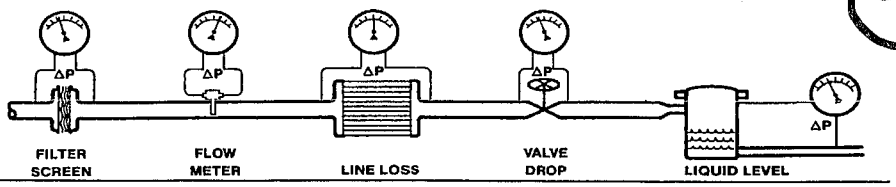
(4)

Mid-West® Instrument



6500 Dobry Dr., Sterling Heights, MI 48314 U.S.A. Tel:586-254-6500 Fax586-254-6509 E-mail:sales@midwestinstrument.com

January 3, 2006

USC - FCCCHR
JAN – 6 2006
PAUL H. SCHWARTZ

Mr. Paul Schwartz, P.E.
Chief Engineer
Foundation for Cross-Connection Control and Hydraulic Research
University of Southern California
Kaprielian Hall 200
Los Angeles, CA 90089-2531

Subject: Comments on the MRC Draft 12-1-05 Section 10.3

Dear Paul,

We have reviewed the MRC Draft 12-1-05, Draft Synopsis of the MRC 15 November Meeting and MRC Response to Comments on 5-2-05 Draft and have the following comments on Section 10.3.

2 MID 1

Section 10.4.1.1 Drawings and Specification & Response MID3 – Since the Foundation Staff acknowledges that confidential information is being provided by the manufacturers please confirm that the Foundation and its' staff will sign a Confidentiality/Non-Disclosure Agreement with the manufacturers if a manufacturer so requests.

2 MID 2

Section 10.4.2.2.1 Accuracy Test & Responses MID5 & MID6 – The MRC has provided only one concrete example of when a test kit reading may actually be taken with the pointer moving upscale. The only example is when the test kit is lowered to the centerline of the DC should water in the sight tube recede. Fluctuating line pressures causing the test kit to "encounter ascending motions" are not disputed; however, no example to date has been given where test kit readings are taken, recorded and backflow prevention assemblies are passed or failed during "ascending motions caused by fluctuating line pressures".

Since the pass/fail pressure for DC check valves is 1.0 PSID and that is the only concrete example cited where a test kit reading may be recorded with the pointer moving upscale, we request that the Accuracy Requirement be changed to read "The Field Test Kit shall maintain and accuracy of +/- 0.2 PSID (1.378 kPa) for an increasing and decreasing differential pressure reading at 1.0 PSID (6.89 kPa) and +/- 0.2 PSID (1.378 kPa) on decreasing differential pressures from 15.0 PSID to 2.0 PSID (103.4 kPa – 13.79 kPa)." If this change is adopted the "Steps:" should be revised accordingly.

2 MID 3

Section 10.4.2.2.1 Accuracy Test & Response MID7 – Revise the "Requirement:" to test in the vertical position only and delete step 12 from the "Steps:" to be consistent with the revised Section 10.4.1.2.

Please contact me if you would like to discuss any of these comments.

Respectfully submitted,

Michael A. Lueck

Michael A. Lueck
Vice-President, Engineering & Quality Assurance

5

Mike Lueck

From: Mike Lueck
Sent: Tuesday, January 03, 2006 10:11 AM
To: Paul Schwartz (pschwart@usc.edu)
Cc: Henry W. Chang
Subject: Comments on the "12/1/05 Draft"

Dear Paul and Henry,

Happy New Year. Attached are our comments on the 12/1/05 Draft of Section 10.3. It is now down to 1 page!

I urge you to give serious consideration to the Accuracy Requirements. You have given a concrete example of where a test reading may be taken with the pointer moving upscale on the DC test if the test kit is lowered to the centerline of the DC so I can agree with ascending and descending at 1.0 PSID. You have failed to give concrete examples of any other point where a reading will be taken with the pointer moving upscale. I don't dispute that a pressure fluctuation on and RP will cause the pointer to move upscale but it will always drop back to the check valve DP and you will always drop the reading to the relief valve opening point.

I respectfully urge you to consider accuracy ascending and descending at 1.0 PSID and descending from 15.0 to 2.0 PSID.

The other main comment is editorial requesting that the accuracy test procedure be revised to match the requirement of the test kit dial or display being in the vertical position.

I'll express mail a hard copy of my comments too.

Best regards,

COPY

Mike Lueck
Mid-West Instrument
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January 6, 2006

Paul Schwartz
Chief Engineer
USC Foundation for Cross Connection and Hydraulic Research
University of Southern California
Los Angeles, CA 90089-2531

Dear Mr. Schwartz:

Please note Watts Regulator has reviewed the proposal adopted by the 10th Edition Manual Review Committee titled WIL 11 with regards to modifying sections pertaining to copper alloys (10.1.3.4, et al.) After reviewing the wording of the new proposal we agree that some definition must be provided that allows for alternate alloys to be utilized in the assemblies. However, we feel that the proposed wording is too general and would allow potential use of sub-standard materials.

Over the past few years, Watts Regulator has performed significant studies on different copper alloys. From our own testing and other available research we have concluded that there can be significant performance differences in materials that contain more than 79% copper and less than 15% zinc versus those that contain less than 79% copper and more than 15% zinc.

In the interest of accommodating additional flexibility in copper alloy use, Watts Regulator would propose wording per the following example:

10.1.3.4 Body and Cover 2 WAT 1

Materials to be used in construction of these parts of the assembly shall be valve bronze conforming to any ASTM Designation: ~~B61 or B62 or B584 UNS number C84400 or other~~ bronze alloys that contain at least 79% copper and less than 15% zinc; ~~Alloys containing less than 79% copper and/or more than 15% zinc shall be tested for dezincification resistance per ISO 6509 with a 200 micrometer maximum average depth of penetration.;~~ or gray iron which conforms to ASTM Designation: A126, Class B or Class C; or ductile iron which conforms to ASTM Designation A536, Grade 65-45-12; or stainless steel which conforms to ASTM Designation: A276 or A296 either UNS No. S304, S30500, S31600 or Schedule 40 Steel pipe and flanges – suitable protected against corrosion (see 10.1.3.14 Protective Coatings); or engineered plastic.

(7)

Watts Regulator is compiling a report that substantiates our position and would welcome the opportunity to present this information to the USC staff and/or MRC. Watts Regulator appreciates your time and consideration in this matter. Please feel free to either contact Arthur Butters or the undersigned to discuss any comments or questions that you may have in regards

Regards,

Jeff Scilingo

Jeff Scilingo
Director of Engineering
Watts Regulator Company
(978) 689-6249

cc: E Elliott
D. Deviney
B. Parrott
K. Munson
A. Butters

RAND ENG (8)

Subject: USC 10th edition comments

Hi Paul

Thanks for the opportunity to comment on the 12-5-05 Draft. I do have a few areas of concern. I have tried keeping my comments brief and as such the committee may have questions or want additional information. . If you feel an appearance before the committee would be helpful I would be glad to do it. I would like to do all I can to help this move forward in an expeditious way.

Comment:
Section 10.1.3.4, 10.1.3.5, 10.1.3.6, 10.1.3.8, 10.1.3.10
Delete "Alloys containing less than 79% copper and/or more than 15% zinc shall be tested for dezincification resistance per ISO 6509 with a 200 micrometer maximum average depth penetration"

Please consider the following: 2R1

1. No data or test results have been presented showing that a 200 micrometer average depth of corrosion per ISO 6509 is equivalent to dezincification that occurs in the current approved alloys (79% min copper and max. 15% zinc). It is the burden of the proponent to show equivalency.

2. In countries where dezincification resistant (yellow brass) is allowed it is considered an upgrade from yellow brass not an equivalent to alloys with less than 15% zinc.

3. An average corrosion depth of 200 micrometers is not globally accepted. The United Kingdom allows only 100 micrometers max depth and not even an average.

4. Water treatment is the United States makes our water chemistry different and thus we have different corrosion mechanisms in our water then in water in other parts of the world.

5. The backflow manufactures in the United States no longer have concern over finding new alloys that reduce lead leaching .There is now a wide enough selection of alloys (79% copper and 15% zinc max) with reduced lead or lead free for the industry to comply with lead reduction requirements. The industry (BPMA) does not support this change. Only one manufacture of approved backflow preventers supports this change.

6. The alloys that the proposal will allow (brass alloys 60% copper 40% zinc) can not give us the longevity our industry and users have come to expect in a field serviceable/repairable backflow preventers.

Respectfully submitted
Rand Ackroyd
Rand Engineering Inc.