Endress+Hauser
People for Process Automation

Endress+Hauser Flowtec Division USA Greenwood, Indiana USA

October 14, 2021

Charles Stutesman, Committee Chair
Southernern Weights and Measures Association
Specifications & Tolerances Committee

Specifications & Tolerances Agenda Items – Block 5 and LPG-15 and MFM-15

Dear Mr. Stutesman,

Regarding the 2021 NEWMA Specifications and Tolerances Agenda items:

1) Please withdraw all items in Block 5.
2) Please revise items LPG–15.1 and MFM-15.1 as noted below.
3) Please forward the revised items LPG–15.1 and MFM-15.1 as voting items.

Background

In September 2014, I submitted a Form 15 proposing the revision of the Liquid Petroleum Gas and Anhydrous Ammonia Liquid-Measuring Devices (LPG) Code and the Mass Flow Meters (MFM) Code sections N.3 Test Drafts that would edit the content and add N.3.2 to describe the test using a reference meter. These items moved through the Weights and Measures Associations. In open hearings at the regional association meetings and at the National Conference on Weights and Measures (NCWM) Meetings, several weights and measures representatives rose in support of these items. The Liquid Petroleum Gas Association wrote a letter in support of this item. The proposed items had been forwarded for a vote at the 2016 NCWM Annual Meeting. However, at that time, the Specifications and Tolerance (S&T) Committee changed the item status to Developing.

Since that time, I have provided all the information requested of the NCWM S&T Committee to move the items forward.

I recall that in 2017, the National Institute of Standards and Technology (NIST), Office of Weights and Measures (OWM) and Henry Oppermann, representing Seraphim Test Measure, rose to comment at the NCWM annual meeting to state that there was no definition of “field reference standard meter”. Responding to those comments, in September 2017, I submitted a Form 15 proposal to define a field reference standard meter and strike the definition of transfer standard found in Handbook 44 Appendix D and to also amend the terminology in the Cryogenic Liquid-Measuring Devices (CLM), Carbon Dioxide Liquid-Measuring Devices (CDL) and Hydrogen Gas-Measuring Devices (HGM) Codes. (This recommendation is found in the item group Block 5.) At the same time, in September 2017, NIST OWM submitted a Form 15 to define a field reference standard meter and strike the definition of transfer

Endress+Hauser Flowtec AG
Division USA
2330 Endress Place
Greenwood, IN 46143
Phone: 317-701-0823

standard found in Handbook 44 Appendix D and to also amend the terminology in the Cryogenic Liquid-Measuring Devices (CLM), Carbon Dioxide Liquid-Measuring Devices (CDL), Hydrogen Gas-Measuring Devices (HGM), Scales (SCL), Automatic Belt Weighing Systems (ABW), Automatic Weighing Systems (AWS) Codes. (This proposal is found in the item group Block 1.)

In 2018, Seraphim Test Measure submitted a Form 15 to add a new section to the General (GEN) Code and to amend NIST Handbook 44, Appendix A section 3.2 and amend Appendix D definition of transfer standard and add a new definition for field standards. (This proposal is found in the item GEN-9.1.)

It was at the 2019 NCWM Interim Meeting that the S&T Committee considered that the above-described items were addressing a similar topic and they grouped the items. In July 2019, at the National Conference on Weights and Measures (NCWM) Annual Meeting, chairman Brett Gurney asked the submitters and the S&T representatives to participate in a Task Group to work on the items and to forward recommendations to the NCWM S&T committee. A Task Group was formed to work the items and return with a recommendation. The Field Standards Task Group met frequently over the course of two years. The work of the Field Standards Task Group stalled. The time designated for the Task Group ended in July 2021.

In July 2021, at the National Conference on Weights and Measures Annual Virtual Meeting, the Specifications and Tolerances Committee removed the items LPG 15.1 and MFM 15.1 from Block 1 and placed them back on the Committee's agenda. The items had been previously combined because the Committee believed them to be related.

I worked with the Field Standards Task Group to move forward LPG–15.1 and MFM 15.1 as well as the other items proposed in the Block. However, most of the Task Group discussion centered on a NIST OWM test program which has been stalled for over 3 years. Unfortunately, the topics related to the titles "master meter", transfer standards" and "field standards" were not discussed and the Task Group did not forward a recommendation.

Present – Western Weights and Measures Association Annual Meeting and Revised Proposal

As stated above, the Block 5, LPG–15.1 and MFM-15.1 were separated from the all-encompassing block of items. At the Western Weights and Measures Association (WWMA) Meeting, I listened to testimony during the open hearings and to the deliberations of the WWMA S&T committee. I have come to realize that creating a new definition not currently in NIST Handbook 44 is taking away from the two important items, LPG–15.1 and MFM-15.1.

To move LPG–15.1 and MFM-15.1 forward, I believe that language can be changed in the proposals:

1) Revise the language in the proposals LPG–15.1 and MFM-15.1 from Field Reference Standard Meters to Field Standard.
2) Withdraw Block 5 items which was originally intended to add a new definition to Handbook 44 Appendix D and was to revise language to the Carbon Dioxide Liquid Measuring Devices, Cryogenic Liquid Measuring Devices, Hydrogen Gas Meter Codes.

The terminology for "field standard" is well described in Handbook 44 Appendix A, Fundamental Considerations, Section 3, Testing Apparatus. The revised "field standard' term is the language proposed by NIST in Block 1 of the NEWMA S&T agenda.

Present – Northeastern Weights and Measures Association Interim Meeting and Revised Proposal

I attended the Northeastern Weights and Measures Association Interim Meeting. I listened to comments about the above requested changes. There was a comment from a past NIST representative regarding the test draft size for CNG dispensers. The NIST EPO 28 describes the place in service test of a CNG dispenser where there is a 1/3, 2/3 and full cylinder test. I have forwarded that NIST EPO 28 with my letter.

I would like to note that the difficulty of this test is significant due to the small in size, but heavy weight of the required DOT Type 1 steel cylinder used for testing and the need to use a scale with a 0.005 lb scale division. A field inspector explained to me that there is also another issue in that when the shutoff valve is used to stop the flow into the tank, the dispenser will automatically sense that the pressure in the delivery line has equalized and will thus shutdown the dispenser. The field inspector pointed out to me that the 1/3, 2/3 and full cylinder test is unrealistic in that CNG vehicle users would not likely dispense such small quantities to the vehicle because that vehicle tanks are larger DOT Type 2, 3 and 4 composite cylinders which are approved for vehicle use.

I spoke with a National Type Evaluation Program inspector. He informed me that while the 1/3, 2/3 and full cylinder test might be conducted during a type test, it is common that the test cylinder is significantly larger. I asked whether he had used the 1/3, 2/3 and full test to place any CNG dispensers into service. He responded that he looks at the tolerance of the full delivery. He stated that he had not seen a need for the 1/3, 2/3 and full cylinder test.

The NIST EPO 28 was written in the mid-1990s. The copy that I forwarded is a draft revision dated 2014. The NIST website does not have a final version of this 2014 draft. In my opinion, the NIST EPO is outdated with respect to current industry practice and consumer usage. I would be happy to work with NIST Office on Weights and Measures to complete the 2014 draft revision of EPO 28.

In my original submittal for MFM-15.1, I explained that using a flow meter for a Field Standard is well suited to examining CNG dispensers.

Present – Southern Weights and Measures Association Annual Meeting and Revised Proposal

At the Southern Weights and Measures Association Annual Meeting, the S&T Committee considered comments in Open Hearings. The Committee accepted the recommended proposal to withdraw Block 5 and accepted the recommended changes to LPG-15.1 and MFM-15.1 N.3.2 to strike the words "reference" and "meter". The Committee recommended that the revised LPG-15.1 and MFM-15.1 items be moved forward Voting status.

During the SWMA Voting session, LPG-15.1 and MFM-15.1 were presented for a vote to the

representatives of the Southern. A representative of Seraphin Test Measures rose to object stating that the content of N.3.1 and N.3.2 were in conflict. I rose to explain to the SWMA body that N.3.1 describes a minimum test and N.3.2 describes a minimum test quantity. The SWMA unanimously voted to accept LPG–15.1 and MFM–15.1, as revised, and accepted the S&T Committee Final Report in which Block 5 was Withdrawn.

The proposed LPG–15.1 and MFM–15.1, with the recommended revisions, are fully developed. Now is the time to move these items forwards to an acceptance vote at the 2022 NCWM Annual Meeting. I request adoption of the items LPG–15.1 and MFM–15.1 as revised below. Please move the items forward as voting items at the NCWM Annual Meeting in July 2022.

Thank you for your consideration.

Sincerely,

Michael Keilty
Standards and Metrology Manager
Endress+Hauser Flowtec AG, Division USA

Endress+Hauser
People for Process Automation

Below is revised from what is shown in S&T agenda

LPG-15.1 N.3. Test Drafts.

Previously LPG-4

Note: In 2019 this item was combined with Block 1 "Terminology For Testing Standards" and other items that addressed terminology for standards and the use of "master meters." Based on comments heard during the 2021 Annual Meeting, the S&T Committee recommended that all items that were combined with Block 1 "Terminology For Testing Standards" that originally appeared as a separate item or a separate block of items on the S&T agenda prior to 2019, be removed from Block 1 "Terminology For Testing Standards" and appear as originally presented.
Item LPG-15.1 was removed from Block 1 "Terminology For Testing Standards" and now appears as a separate item on the 2022 Interim Meeting agenda.

Source:
Endress + Hauser Flowtec AG USA

Purpose:
Amend Handbook 44 to allow field ~~reference~~ standards ~~meters~~ to be used to test and place into service dispensers and delivery system flow meters.

Item Under Consideration:
Amend Handbook 44, LPG and Anhydrous Ammonia Liquid-Measuring Devices as follows:

N.3. Test Drafts.

N.3.1 Minimum Test – Test drafts should be equal to at least the amount delivered by the device in 1 minute at its normal discharge rate.
(Amended 1982)

N.3.2. Field ~~Reference~~ Standard ~~Meter~~ Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested. (Added 20XX)

Below is revised from what is shown in S&T agenda

MFM-15.1 N.3. Test Drafts.

Previously MFM-2

Note: In 2019 this item was combined with Block 1 "Terminology For Testing Standards" and other items that addressed terminology for standards and the use of "master meters." Based on comments heard during the 2021 Annual Meeting, the S&T Committee recommended that all items that were combined with Block 1 "Terminology For Testing Standards" that originally appeared as a separate item or a separate block of items on the S&T agenda prior to 2019, be removed from Block 1 "Terminology For Testing Standards" and appear as originally presented.
Item MFM-15.1 was removed from Block 1 "Terminology For Testing Standards" and now appears as a separate item on the 2022 Interim Meeting agenda.

Source:
Endress + Hauser Flowtec AG USA

Item Under Consideration:
Amend Handbook 44, Mass Flow Meters Code as follows:

N.3. Test Drafts.

N.3.1 Minimum Test – The minimum test shall be one test draft at the maximum flow rate of the installation and one test draft at the minimum flow rate. More tests may be performed at these or other flow rates. (See T.3. Repeatability.)

(Amended 1982 and 20XX)

N.3.2. Field ~~Reference~~ Standard ~~Meter~~ Test. – The minimum quantity for any test draft shall be equal to or greater than the amount delivered in one minute at the flow rate being tested.

(Added 20XX)