



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, D.C. 20590

JUL 14 2016

Mr. Russell Clautice  
ESH&Q, Institutional Services Contract  
URS Federal Technical Services, Inc.  
National Aeronautics and Space Administration  
Kennedy Space Center  
P.O. Box 21025, M/C: ISC-8000  
Florida 32815-0025

Reference No. 16-0047

Dear Mr. Clautice:

This responds to your February 23, 2016 email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180). Specifically you ask if a weight scale used in lieu of a burette to measure water displacement in hydrostatic testing of compressed gas cylinders is required to be calibrated.

In accordance with 49 CFR 180.205(g)(3), each day before retesting, a cylinder retester is required to use a calibrated cylinder or other method authorized in writing by the Associate Administrator to verify the accuracy of a hydrostatic retest system, including both the pressure-indicating device and the expansion-indicating device (EID). The pressure-indicating device, as part of the retest apparatus, must be accurate within  $\pm 1.0\%$  of each individual test pressure to be tested that day. The expansion-indicating device, as part of the retest apparatus, gives a stable reading of expansion and is accurate to  $\pm 1.0\%$  of the total expansion of any cylinder to be tested that day or 0.1 cc, whichever is larger.<sup>1</sup> However, if the pressure indicating device or EID, as applicable, is not in compliance with an accuracy of  $\pm 0.5\%$ , or better, of its full range, retesting is not permitted on that day.

Section 180.205(g)(4) specifies that the calibrated cylinder must show no permanent expansion. This is a separate requirement and is not related to the test equipment  $\pm 1.0\%$  accuracy requirement. This means that the water level in the burette or the weigh bowl must return to the same point where it began - not slightly higher or lower. After depressurization of the calibrated cylinder, all of the displaced water must return to the water jacket. Any volume of water measured in the EID above zero (or the original reading) indicates permanent expansion of the calibrated cylinder.

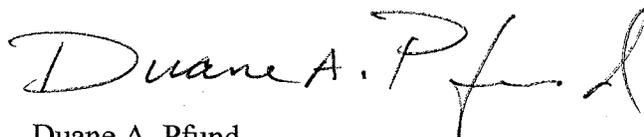
<sup>1</sup> This requirement cannot be met without a calibrated weight scale. For frequency of calibration, consult the manufacturer's guidelines as indicated in Compressed Gas Association (CGA) C-1, Appendix B-B3.

If this occurs, the equipment has not been proven to be accurate in accordance with the HMR.

With regard to your reference to CGA C-1, currently the HMR do not incorporate the publication by reference. We may consider incorporating by reference this publication or certain provisions of the CGA C-1 publication in a future rulemaking.

I hope this satisfies your inquiry. Please feel free to contact us if we can be of further assistance.

Sincerely,

A handwritten signature in cursive script that reads "Duane A. Pfund". The signature is written in dark ink and is positioned above the typed name.

Duane A. Pfund  
International Standards Coordinator  
Standards and Rulemaking Division

**Goodall, Shante CTR (PHMSA)**

*Antonelli  
173301  
General Requirements  
16-0047*

**From:** Geller, Shelby CTR (PHMSA)  
**Sent:** Monday, March 14, 2016 9:36 AM  
**To:** Hazmat Interps  
**Subject:** FW: Letter of Interpretation Request

Dear Shante and Alice,

I also wanted to follow up on Mr. Clautice's request as it was not in the database either.

Thanks,  
Shelby

**From:** Geller, Shelby CTR (PHMSA)  
**Sent:** Tuesday, February 23, 2016 3:13 PM  
**To:** Hazmat Interps  
**Subject:** FW: Letter of Interpretation Request

Dear Shante and Alice,

Forwarded is a request for a letter of interpretation. Mr. Clautice spoke with both Jordan Rivera and Steve Andrews in the HMIC.

Thanks,  
Shelby

**From:** Clautice, Russell L. (KSC-ISC-1160)[URS Federal Services, Inc.] [<mailto:russell.l.clautice@nasa.gov>]  
**Sent:** Tuesday, February 23, 2016 8:38 AM  
**To:** INFOCNTR (PHMSA)  
**Cc:** Clautice, Russell L. (KSC-ISC-1160)[URS Federal Services, Inc.]; Case, Dennis R. (KSC-ISC-1160)[URS Federal Services, Inc.]; Adamson, Thomas D. (KSC-ISC-1160)[URS Federal Services, Inc.]; Richard Boggs  
**Subject:** Letter of Interpretation Request

To Whom it may concern:

I have a question concerning the calibration requirements of the weight scale used during hydrostatic testing of compressed gas cylinders.

Specifically, when a weight scale is used to measure water displacement in lieu of a burette, is the scale required to be calibrated? I have researched the 49CFR and couldn't locate any information. I also have researched CGA C-1 and identified the following statement in Appendix B, B3 Expansion Indicating device: "For digital devices, consult the manufacturer's guidelines for recalibration."

I have discussed this question with a "Cylinder Engineer" at DOT and was told that the cylinder retester is required to maintain calibration on the weight scale by following the requirements of CGA C-1. In addition, the Cylinder Engineer informed me that CGA C-1 is in the process of becoming a reference document.

Thank You,

Russ Clautice  
ESH&Q, Institutional Services Contract (ISC)

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