U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave, S.E.
Washington, D.C. 20590

AUG 29 2013

Mr. Richard Lupien
Manager, Combustion Research Center
Kidde-Fenwal, Inc.
90 Brook Street
Holliston, MA 07146

Ref. No.: 13-0110

Dear Mr. Lupien:

This is in response to your May 16, 2013 email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to pressure relief devices (PRD) on Department of Transportation 4BW-250 specification cylinders. In your letter, you state that you manufacture a fixed fire suppression system that utilizes DOT- 4BW250 cylinders filled with a dry chemical agent and pressurized with nitrogen to a pressure of 175 psig at 70 °F. Specifically, you ask if you may use a UL-rated fusible plug instead of a CG-3 fusible plug required by Compressed Gas Association (CGA) publication S-1.1.

Unless excepted, a cylinder filled with a gas and offered for transportation must be equipped with one or more pressure relief devices sized and selected as to type, location, and quantity, and tested in accordance with CGA S-1.1 (see § 173.301(f)(1)). Section 173.301(f)(5)(ii) states that a pressure relief device is not required on "a cylinder with a water capacity of less than 454 kg (1000 lbs) filled with a nonliquefied gas to a pressure of 300 psig or less at 21 °C (70 °F), except for a DOT 39 cylinder or a cylinder used for acetylene in solution." The cylinders provided in your example do not require pressure relief devices. However, should you choose to install a PRD, it must conform to CGA publication S-1.1.

I hope this information is helpful. If you have further questions, please do not hesitate to contact this office.

Sincerely,

Delmer Billings
Senior Regulatory Advisor
Standards and Rulemaking Division

Leary
§173.3.01
Cylinders
13-0110

Drakeford, Carolyn (PHMSA)

From: INFOCNTR (PHMSA)
Sent: Thursday, May 16, 2013 5:01 PM
To: Drakeford, Carolyn (PHMSA)
Subject: FW: Interpretation question - 49 CFR 173.300

Hi Carolyn,

This caller requested we submit this e-mail as a formal letter of interpretation.

Thanks,
Victoria

From: Lupien, Richard CCS [mailto:Richard.Lupien@Kidde-Fenwal.com]
Sent: Thursday, May 16, 2013 9:35 AM
To: INFOCNTR (PHMSA)
Subject: Interpretation question - 49 CFR 173.300

To the Hazardous Materials group,

Our company seeks formal interpretation on a pressure relief question.

We manufacture fixed fire suppression system units that utilize 4BW-250 cylinders. The cylinders are filled with a dry chemical agent suppressant and pressurized with nitrogen to 175 psig at 70 deg F as the expellant gas. The units employ a 212 deg F. fusible plug (CG-3 device) sized to comply with CGA S-1.1.

49 CFR 173.301(f) requires a pressure relief device sized and selected to CGA S-1.1 be utilized. The CGA pamphlet outlines only two fusible plug devices with the maximum unit at 212 deg F. nominal temperature. Is it DOT's intention or interpretation that no other fusible temperature plugs be allowed in service even if the level of safety offered is considerably conservative?

In our example, the consideration is to utilize a UL listed fusible plug rated to 286 deg F instead of the CG-3 plug at 212 deg F. The higher rated plug would incorporate the same size relief ports as the present plug. Because the cylinder is pressurized with nitrogen, the pressures developed in the cylinder at the elevated temperatures remain at levels well below the test pressure and in nearly all cases are even below the service pressure. Below is the nitrogen pressure levels in the cylinder at various temperatures:

Temperature, deg F.	Nitrogen pressure in 4BW-250 rated cyl, psig (test pressure of 500 psig)
70 deg F.	175 psig
131 deg F	197 psig (this complies with the 49 CFR 173.301 (a) (8) requirement for the pressure at 131 deg F. to be less than 5/4 x the service pressure. 197 psig < 312 psig
212 deg F.	226 psig
286 deg F	252 psig

360 deg f.	279 psig

As seen in the table, the nitrogen pressure remains significantly below the test pressure of the cylinder at the moment the higher-rated fusible plug would release. We believe the CGA limits on available sizes are restrictive and although critical for products such as acetylene may not be flexible enough for fire suppression products that use only nitrogen as the expellant gas.

Thank you for your time and consideration.

Sincerely,

Rich Lupien
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