



U.S. Department
of Transportation

Pipeline and Hazardous
Materials Safety
Administration

1200 New Jersey Avenue, SE
Washington, DC 20590

JUN 19 2017

Tae Kim
Design Release Engineer
Quantum Fuel Systems
25242 Artic Ocean Drive
Lake Forest, CA 92630

Reference No. 17-0030

Dear Mr. Kim:

This letter is in response to your February 24, 2017, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the general requirements for shipment of compressed gases and other hazardous materials in cylinders, United Nations pressure receptacles, and spherical pressure vessels. You include a diagram of a manifolded cylinder system and specifically seek confirmation of your understanding that the regulations in § 173.301(g) would allow the quarter turn valve or shutoff valve to remain in the open position if an air operated valve (AOV) is closed while the cylinders are manifolded in transportation.

Your understanding is not correct. According to § 173.301(g), each cylinder must be equipped with an individual shutoff valve that must be tightly closed while in transit, except cylinders containing a Division 2.2 material. While your original email did not specify the primary material being filled inside the cylinders, you explained in a subsequent email and phone conversation with a member of my staff that it would be either a Division 2.1 or Division 2.2 material. The individual shutoff valve for cylinders filled with a Division 2.1 material cannot remain open while in transit even if an AOV is installed. However, cylinders filled with a Division 2.2 material are not subject to the individual shutoff valve requirements and can remain in the open position while in transit.

In addition, the HMR do not prohibit the use of an AOV installed on manifolded cylinder systems. However, in order to use an AOV while transporting a Division 2.1 material in the manner you describe, you must submit an application for a Special Permit.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

Dirk Der Kinderen
Chief, Standards Development Branch
Standards and Rulemaking Division

Baker
\$173 301
Cylinder
1-7-0030

Dodd, Alice (PHMSA)

From: INFOCNTR (PHMSA)
Sent: Wednesday, March 01, 2017 9:33 AM
To: Hazmat Interps
Subject: FW: Interpretation request for Title 49 part 173 301g
Attachments: PHMSA-DOT Title 49 part 173 301g 2-24-17.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Shante/Alice,

Please submit this as a letter of interpretation. Mr. Kim spoke with Jodi.

Please let me know if you have any questions.

Thanks,
Jordan

From: Tae Kim [mailto:tkim@qtw.com]
Sent: Friday, February 24, 2017 8:22 PM
To: PHMSA HM InfoCenter <PHMSAHMInfoCenter@dot.gov>
Subject: Interpretation request for Title 49 part 173 301g

Dear Sir or Madam,

Please see attached document regarding request for interpretation of Title 49 part 173 301g.

Best regards,

Tae Kim

Design Release Engineer



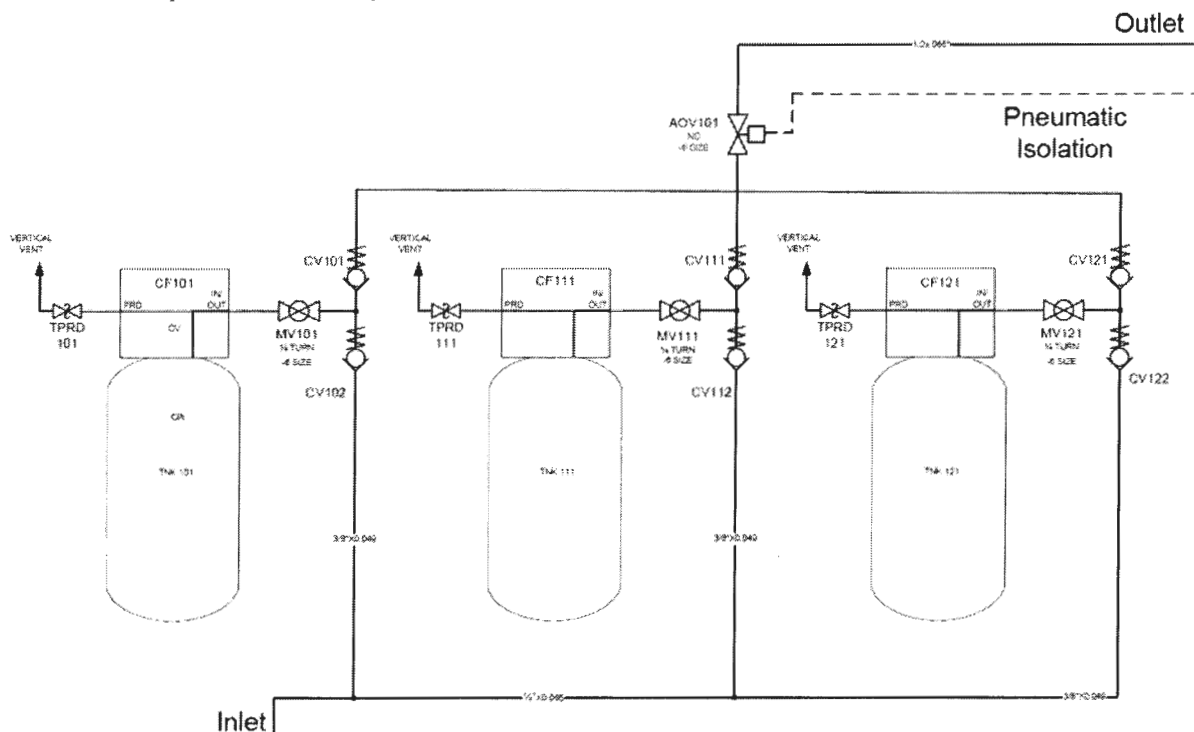
25242 arctic ocean drive | lake forest | california | 92630 | usa |
tel. (949) 399 4614 | fax (949) 930 3401

February 24, 2017

Regulation reference: 49 CFR 173.301 General requirements for shipment of compressed gases and other hazardous materials in cylinders, UN pressure receptacles and spherical pressure vessels...

(g) *Manifolding cylinders in transportation.* (1) Cylinder manifolding is authorized only under conditions prescribed in this paragraph (g). Manifoldd cylinders must be supported and held together as a unit by structurally adequate means. Except for Division 2.2 materials, **each cylinder must be equipped with an individual shutoff valve that must be tightly closed while in transit.** Manifold branch lines must be sufficiently flexible to prevent damage to the valves that otherwise might result from the use of rigid branch lines. Each cylinder must be individually equipped with a pressure relief device as required in paragraph (f) of this section...

Our interpretation of this regulation would allow for the use of a system design as shown in the diagram below, figure 1. This diagram represents the plumbing on each row of cylinders within the trailer. There may be up to 17 rows of cylinders per trailer, refer to figure 2 on the next page. The intent is to leave the ¼ turn valve in the open position but close the air actuated valve for transportation. The inlet check valves close the inlet lines from the cylinders. The outlet check valves isolate the contents of each cylinder. The air actuated valve closes the cylinders off from the outlet lines. There would be one air actuated valve per row of three cylinders.



Legend:

- TPRD 101, 111, 121 are thermally activated pressure relief device.
- TNK 101, 111, 121 are pressure tanks
- CF 101, 111, 121 are tank heads
- MV 101, 111, 121 are manual ¼ turn valves
- CV 101, 111, 121, 102, 112, 122 are check valves
- ADV101 is an air actuated valve.

Figure 1

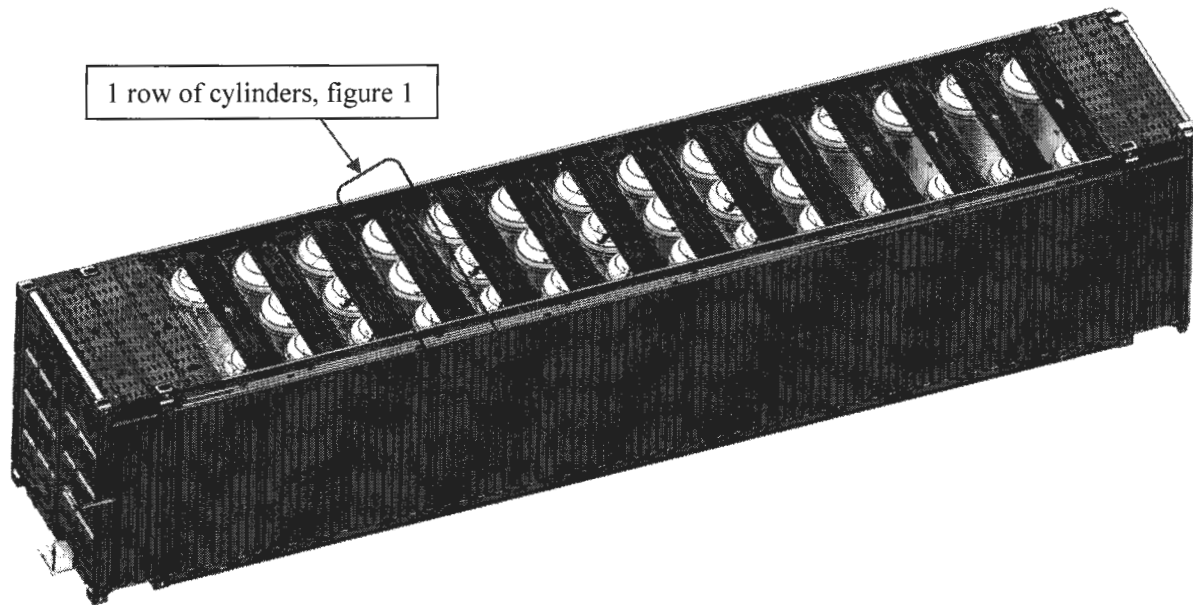


Figure 2

Best regards,

Tae Kim
Quantum Fuel Systems LLC