



U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

JAN 1 2007

400 Seventh Street, S.W.
Washington, D.C. 20590

Mr. Everett Snoeberger
Alloy Custom Products
9701 SR 25 North
Lafayette, IN 47905

Ref. No.: 06-0243

Dear Mr. Snoeberger:

This is in response to your October 19, 2006 letter and enclosed video regarding the use of MC-338 cargo tank motor vehicles as specified under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Your scenarios revolve around the shipment of hazardous materials in vacuum insulated MC-338 cargo tank motor vehicles. Your questions are paraphrased and answered as follows:

Q1: Section 173.33(g) requires each liquid filling and liquid discharge line in an MC-338 cargo tank to be provided with a remotely controlled internal self-closing stop valve except when the MC-338 cargo tank is used to transport argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. Section 178.338-11(b) specifies that for MC-338 cargo tanks, each liquid filling and liquid discharge line must be provided with a shut-off valve located as close to the tank as practicable and, unless the valve is manually operable at the valve, the line must also have a manual shut-off valve. This provision allows for either an internal or an external stop valve placed as close to the tank as possible. We have found that most vacuum insulated MC-338 cargo tanks operate at temperatures below the reliable operating temperature of available internal self-closing stop valves, and currently no manufacturer builds an internal self-closing stop valve that will operate reliably at temperatures that may reach minus 452 °F. Therefore, is a MC-338 required to have a remotely controlled internal self-closing stop valve as specified in § 173.33(g)?

A1: The answer is no. MC-338 cargo tanks that utilize an external self-closing stop valve for compliance with the requirements in § 178.338-11(b) may be used to transport hazardous materials in commerce, notwithstanding the provisions in § 173.33(g). This issue will be clarified in a future rulemaking.

Q2: Section 177.834(j) requires cargo tanks to be transported with all valves and other closures in liquid discharge systems to be closed and free of leaks unless transported in accordance with § 173.29(b)(2). This provision was added as a result of HM-222B (May 30, 1996; 61 FR 27166) to consolidate the closure requirements for cargo tanks transporting Class 3 (flammable liquid) materials, class 8 (corrosive) materials, and Division 6.1 (poisonous) materials. This rule did not consider the impact this provision would have on MC-338 cargo tanks that transport cryogenic liquids. These tanks have



060243

173.33(g)
177.834

external self-closing valves that are normally transported in an open position. These valves are designed to close with a tremendous amount of force to ensure proper closure. Subsequently, these valves require a large amount of force and effort to open. As a result, the potential for physical injury to employee personnel is increased and the ability of the valve system to operate is potentially compromised as a result of repeated cycling (opening, closing, and testing). Does § 177.834(j) permit emergency self-closing valves on MC-338 cargo tanks to be either open or closed during transit?

A2: The answer is yes. External emergency self-closing valves on MC-338 cargo tanks containing cryogenic liquids may remain either open or closed during transit. We will clarify this issue in a future rulemaking.

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

Sincerely,

A handwritten signature in cursive script that reads "Hattie Mitchell".

Hattie Mitchell
Chief, Regulatory Review and Reinvention
Office of Hazardous Materials, Standards

Alloy Custom Products Inc.

Mailing: P. O. Box 198, St. Rd. 25 S Delphi, IN 46923-0198

Shipping: 9701 St. Rd. 25 N Lafayette, IN 47905-4394

Engineering, Fabricating and Repair of ASME Code Pressure Vessels & Process Equipment and Cryogenic Equipment

PH: 765-564-4684 FAX: 765-564-6032

800-359-2556 E-mail: sales@alloycustomproducts.com

WEB: www.alloycustomproducts.co

Satherthwaite
3173.33(g)
§177.834
Cargo Tank
06-0243

Page 1 of 3

Director, Office of Hazardous Materials
U.S. DOT / PHMSA (PHH-10)
400 7th Street S.W.
Washington, D.C. 20590-0001
Mr. Edward T. Mazzullo

10/19/2006

Dear Mr. Mazzullo,

On behalf of the Industry representative's identified at the end of this letter, please accept this correspondence as our official request for an interpretation of 49 CFR 173.33(g) addressing the requirement for MC 338 cargo tanks to be equipped with internal self closing stop valves, and the requirements in 177.834(j) requiring that all valves in liquid discharge systems are closed.

We respectfully request an interpretation that vacuum insulated MC-338 cargo tanks be excepted from the requirements of 49 CFR 173.33(g) which currently require these tanks to be equipped with internal self closing emergency stop valves. We are requesting that the wording in 49 CFR 173.33(g) be changed to permit MC-338 cargo tanks to be equipped with either an internal or external self closing emergency stop valve. The design and construction requirements in 49 CFR 178.338-11(b) and (c) requires self closing emergency shutoff valves on all liquid fill and discharge lines; and allows either an internal or an external stop valve located as close to the tank as practical.

In addition we are also requesting an interpretation that MC-338 cargo tanks be excepted from the requirement in 49 CFR 177.834 (j) requiring all valves be closed during transit. We would request an interpretation that MC-338 cargo tanks must be equipped with an emergency self closing stop valve that may be open or closed during transit.

Background

In reviewing the regulations concerning the Self Closing Stop Valve's (sometimes referred to by industry as an emergency valve or fire valve) on cargo tanks transporting cryogenic liquids several issues have been identified that adversely affect the ability of manufacturers and transporters to comply with the requirements as currently written. These issues are as follows:

1. Availability of suitable components;
 - a. Internal valves
 - b. External self closing stop valves
2. Normal operating procedures
 - a. External self closing stop valves are open during transit because they are extremely difficult to be reset by the driver once they are closed.
3. Intent of the rules as they were originally written.
 - a. The original intent of the regulation was to provide these cargo tanks with a valve that reliably closes with authority and stops the flow of liquid from lines in the event of an emergency.

First and foremost 49 CFR Part 173.33 (g) requires that all MC-338 cargo tanks to have an internal self closing stop valve but it is impossible to comply with on all MC-338 cargo tanks. Most vacuum insulated MC-338 cargo tanks operate at temperatures below the reliable operating temperature of available internal self closing stop valves and there is currently no manufacturer building this component that will operate reliably at temperatures which may reach minus 452 degrees Fahrenheit. Additionally, the design of these tanks is such that access to the inside of the tank to perform repairs to an internal valve is not practical. Self closing stop valves are necessary and all MC-338 cargo tanks transporting flammable cryogenic liquids are equipped with these devices, but they are located externally and as close as practical to the tank in accordance with 49 CFR Part 178.338-11(b). The definition of an external self-closing stop valve as cited in 49 CFR 178.320(a)(8) states that valve must be designed so that the self-stored energy source is located outside the cargo tank and the welded flange. Locating the self-closing valves externally on a vacuum insulated tank as close as practical to the tank and complying with current requirements does not compromise the safe transportation of these products. This definition further supports the intent of the design and construction requirements in 49 CFR 178.338 and also enhances and facilitates preventive maintenance and testing of the external self closing stop valve.

Based on this information we are requesting that PHMSA issue an interpretation for 173.33(g) which allows for self closing stop valves on MC 338 cargo tanks to be located as close as practical to the cargo tank. In addition we recommend that 173.33(g) be changed to read as follows:

“(g) Remote control of self-closing stop valves—MC 330, MC 331 and MC 338 cargo tanks. Each liquid or vapor discharge opening in an MC 330 or MC 331 cargo tank must be provided with a remotely controlled internal self-closing stop valve, except when an MC 330 or MC 331 cargo tank is marked and used exclusively to transport carbon dioxide. However, if the cargo tank motor vehicle was certified before January 1, 1995, this requirement is applicable only when an MC 330 or MC 331 cargo tank is used to transport a flammable liquid, flammable gas, hydrogen chloride (refrigerated liquid), or anhydrous ammonia.

Each liquid filling and liquid discharge line in an MC 338 cargo tank must be provided with a remotely controlled internal or external self-closing stop valve, except when an MC 338 cargo tank is used to transport argon, carbon dioxide, helium, krypton, neon, nitrogen, and xenon. However, if the cargo tank motor vehicle was certified before January 1, 1995, this requirement is applicable only when an MC 338 cargo tank is used to transport flammable loadings.”

The second issue that has been identified is that 49 CFR 177.834(j) requires that all valves be closed during transit. This regulation was changed as a result of HM-222B in an effort to consolidate the regulations of 177.837(b), 177.839(b), and 177.841(d). These regulations pertain to Class 3 (flammable liquids) materials, Class 8 (corrosive) materials, and division 1 (poison) materials. When these rules were consolidated it was never the intent of the rule to apply to MC-338 cargo tanks. There was no discussion or input from the DOT or industry concerning the effects of this rule change on the transportation of cryogenic liquids in MC-338 cargo tanks

Because these external self closing stop valves close with authority, the ability of these valves to close without leaks may be compromised as a result of frequent cycling (opening, closing, and testing) of these valves. Typically ball valves and swing gate valves are used for this application and are equipped with large spring actuators that close the valve suddenly and with great force. These valves are purposefully designed this way to ensure they close in all emergency situations including situations where ice has collected on the seat of the valve and tremendous force is required to break the ice to ensure the valve closes tightly in an emergency situation. Frequent cycling of these valves exerting this tremendous force causes undue wear on the seals, seats, and stem packings of the valves, and jeopardizes the reliability of these valves to function properly in case of an emergency.

Based on this information we are requesting that PHMSA issue an interpretation of 49 CFR 177.834(j) which will permit the external self closing stop valve to remain open on MC-338 cargo tanks during transit. In addition we recommend that 49 CFR 177.834(j) be changed to read as follows:

(j) Except for a cargo tank conforming to §173.29(b)(2) of this subchapter, a person may not drive a cargo tank motor vehicle containing a hazardous material regardless of quantity unless:

(j)(1) All manhole closures are closed and secured; and

(j)(2) All valves and other closures in liquid discharge systems are free of leaks; and

(j)(3) All valves and other closures in the liquid discharge system must be closed, except the external self

closing stop valve may remain open during transit for MC-338 cargo tanks.

We have provided photos of typical applications of self closing emergency ball and swing gate valves to illustrate the practical application of these safety devices. Enclosed is a video disc demonstrating the closing force and speed of a ball valve with a spring actuator. The second video file demonstrates the difficulty of resetting the spring actuator and the release mechanism. We appreciate your consideration of our request and if you need any additional information please do not hesitate to contact us at (765-564-4684 ext 223)

Sincerely



Everett Snoeberger

Industry Committee

David Hahn
Russell Engineering
9 Dewar Street
Dorchester, MA 02125

Lee Drury
Jack B Kelley
8101 West 34th Avenue
Amarillo, TX 79121

Ron Baker
Cryogenic Vessel Alternative
9528 Warren Avenue 77521
Baytown, TX 77521

Scot Nason
MVE
407 7th Street Northwest
New Prague, MN 56071

Charles Buckley
Transgas
87 Industrial Ave E.
Lowell, MA 01852

Randy Tumbrello
Logistics Express
1100 Town and Country Rd
Orange CA 92688

Alex Varghese
Gardener Cryogenics
Lieg Valley Industrial Park
Bethlehem, PA 18020

Everett Snoeberger
Alloy Custom Products
9701 SR 25 North
Lafayette, IN 47905