U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

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

JUL 22 2008

Mr. Gene Sanders, DGSA
Dangerous Goods Transportation Specialist
Thermo Fisher Scientific
2000 Park Lane
Pittsburgh, PA 15275

Ref. No.: 08-0130

Dear Mr. Sanders:

This is in response to your May 7, 2008 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to refrigerating machines. Your scenario involves the classification of a refrigerating machine containing two types of refrigerant gases, one a Division 2.1, flammable gas and the other a Division 2.2, non-flammable, non-poisonous gas, in separate compressors. Specifically, you ask for the most appropriate description for the refrigerating machine specified above and how to determine the applicability of the compressed gas exceptions for refrigerating machines in § 173.307.

Under § 173.22, it is the shipper's responsibility to properly class and prepare a hazardous material for shipment. This Office does not perform that function. However, based on the information provided in your letter, it is the opinion of this Office that you may be able to take advantage of the exception in § 173.307(a)(4)(iii). When determining the applicability of § 173.307(a)(4)(iii), the combined weight of both gases must be less than 12 kg (25 pounds). Please note that the paragraph (a)(4)(iii) exception does not authorize air shipments.

If your refrigerating machine exceeds the 12 kg (25 pounds) gas limitation for the exception in § 173.307(a)(4)(iii), the machine may be shipped under the terms of a special permit or in accordance with § 173.306(e). Please refer to Part 107, Subpart B, § 107.105 for procedures

for applying for a special permit. If you are able to ship the refrigerating machine in accordance with § 173.306(e), you may describe it as "UN3358, Refrigerating machines, 2.1."

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

Sincerely,

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

Satterthwaite
§ 173.2a(a)
§ 173.115(b)(2)
§ 173.307(a)(4)(iii)
Classification
08-0130

Drakeford, Carolyn <PHMSA>

From: Gorsky, Susan <PHMSA>
Sent: Wednesday, May 07, 2008 3:09 PM
To: Drakeford, Carolyn <PHMSA>
Subject: FW: Precedence of Hazard for Refrigerating Machines

From: Sanders, Gene [mailto:gene.sanders@thermofisher.com]
Sent: Wednesday, May 07, 2008 2:56 PM
To: Gorsky, Susan <PHMSA>
Cc: Richard, Bob <PHMSA>; Richard, Bob <PHMSA>; Richard, Bob <PHMSA>; Mayfield, John
Subject: Precedence of Hazard for Refrigerating Machines

Hello Susan Gorsky,

A certain refrigerating machine (refrigerator) functions by cooling in multiple stages. The refrigerant gas in each stage is separately and independently contained, so that there is no mixing between the refrigerant gases from different stages. The refrigerant gas in one stage is non-flammable and non-toxic, while the refrigerant gas in another stage is non-toxic but is flammable. This message seeks clarification of the proper transport classification for the refrigerator as a whole. It is assumed that use of exceptions should not be considered until the basic classification(s) has(have) been determined.

One argument that could be made is that the refrigerator is one discrete article. Thus, both refrigerant gases would be inside one 'container', and the provisions of 49CFR 173.2a(a) could be used to determine that 2.1 is the primary hazard. 49CFR 173.115(b)(2) would then dictate that there be no subsidiary 2.2 risk, and the one basic description most appropriate for the refrigerator would probably be UN3358, Refrigerating machines, 2.1. This doesn't make sense intuitively, though, because if the hazardous materials (gases) are kept separate then they are probably separate hazardous materials requiring separate classification.

Another argument that could be made is that each compressor and associated tubing is a discrete inner container, and that each stage's compressor is a refrigerating machine on its own. Thus, this refrigerator would have two different basic descriptions, probably UN2857, Refrigerating machines, 2.2, and, UN3358, Refrigerating machines, 2.1. Both descriptions would appear on the shipping paper, which may cause some confusion, as those reading the shipping paper may expect to find two separate refrigerators. The refrigerator itself would have to be 'dual-marked', and would bear both a 2.2 and 2.1 label. Having these two labels may cause confusion, as 173.115(b)(2) may appear to be applicable to those not familiar with the details of the inner workings of the refrigerator. It also seems that adding UN2857 and 2.2 to existing UN3358 and 2.1 hazard communication would not present any additional increase in safety.

A third argument could be made that a refrigerating machine classification is analogous to a Chemical Kit or Consumer Commodity classification. That is, one or more 'base' classifications must be determined before the alternative classification can be considered. Thus, the classification for the refrigerant gas in each different stage must first be determined as if they were enclosed in gas cylinders, (e.g. UN1030, 1,1-Difluoroethane, 2.1, and, UN1078, Refrigerant Gases, n.o.s. (xxx, yyy), 2.2). Then, because the gases are not contained in cylinders, but in compressors in a larger article, reclassification into UN3358 or UN2857 can be considered. Obviously, if there is only one stage, reclassification into UN3358 or UN2857 is simple. If there are multiple stages, and all the stages include flammable gases, or if all the stages include non-flammable gases, then the reclassification is simple.

Thermo Fisher believes that the third argument is the most sensible and reasonable. It avoids the 'common sense' problems with the first argument, and avoids the confusing additional hazard communication of the second argument. It is consistent with established "re-classification" procedures already in wide-spread use. The main piece missing is clear regulatory guidance that UN3358 is an appropriate re-classification when the refrigerating

machine contains both 2.1 and 2.2 gases in separate stages (or compressors). Minor revision to the wording of 173.307(a)(4) may also be desirable.

Do you agree that UN3358, Refrigerating machines, 2.1 is an appropriate transport classification for this refrigerator without UN2857?

Assuming you agree to the preceding question, do you agree that the total quantity of all refrigerant gases in the entire refrigerator should be used when considering the applicability of the 173.307(a)(4)(iii) exception to the refrigerator?

Thank you for your assistance. If you would like a formal request for a rule-making to deal with this issue, please let us know.

Cheers,

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