U.S. Department of Transportation

**Pipeline and Hazardous Materials Safety Administration**

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

Jianke Wang, Ph.D., P.E.
Senior Project Engineer
National Oilwell Varco
2800 N Frazier St.
Conroe, TX 77303

JUN 29 2011

Reference No. 10-0195

Dear Dr. Wang:

This is in response to your e-mail requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR) applicable to UN portable tank design criteria. Specifically, you ask for the definition of "design margin of 1.5" as it is used for determining the safety factor in § 178.274(c)(2). You state that it is your understanding that a design margin of 1.5 could result in a safety factor of 2.5 (1.5+1=2.5).

Sections 178.274(c)(2)(i) and (c)(2)(ii) state that the safety factor under each of the forces specified in paragraph § 178.274(c)(1) must be:

> (i) For metals having a clearly defined yield point, a design margin of 1.5 in relation to the guaranteed yield strength; or (ii) For metals with no clearly defined yield point, a design margin of 1.5 in relation to the guaranteed 0.2% proof strength and, for austenitic steels, the 1% proof strength.

The term "design margin of 1.5" is the safety factor to which the UN Specification portable tank must be designed by calculating the stresses resulting from acceleration loads applied to the tank. The two terms are used interchangeably in the HMR (design margin § 178.274 (c)(2)) and UN Model Regulations (Volume 1 Section 6.7.3.2.10) to determine the minimum ratio between the yield strength of the material and the design stress. In § 178.274 (c)(2) the design margin is equal to 1.5; therefore, the minimum ratio is 1.5. Additionally, please note that an approval agent must evaluate the design and calculations for UN Specification portable tank as required by § 178.273(b).

I hope this information is helpful. Please contact this office should you have additional questions.

Sincerely,

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

McIntyre
§178.274(c)(2)
Portable Tanks
10-0195

## Drakeford, Carolyn (PHMSA)

**From:** INFOCNTR (PHMSA)
**Sent:** Monday, September 13, 2010 10:26 AM
**To:** Drakeford, Carolyn (PHMSA)
**Cc:** DerKinderen, Dirk (PHMSA)
**Subject:** FW: Request for Formal interpretation to the "Design Margin" in Section 178.274 (c)(2) for UN portable tank design criteria

Hi Carolyn,

We received the following request for a formal letter of interpretation at the Info Center.

Thanks,

Victoria Lehman
202-366-1035

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**From:** Wang, Jianke [mailto:Jianke.Wang@nov.com]
**Sent:** Friday, September 10, 2010 4:23 PM
**To:** INFOCNTR (PHMSA)
**Subject:** Request for Formal interpretation to the "Design Margin" in Section 178.274 (c)(2) for UN portable tank design criteria

Dear Sir/Madam,

In Section 178.274 (c)(2) for UN portable tank design criteria, there are

"(2) Under each of the forces specified in paragraph (c)(1) of this section, the safety factor must be as follows:

(i) For metals having a clearly defined yield point, a design margin of 1.5 in relation to the guaranteed yield strength; or

(ii) For metals with no clearly defined yield point, a design margin of 1.5 in relation to the guaranteed 0.2% proof strength and, for austenitic steels, the 1% proof strength.

"

What is the definition of the "design ***margin*** of 1.5"?

To my knowledge, a "design ***margin*** of 1.5" could result in a safety factor of 2.5 (1.5+1=2.5).

Your response will be appreciated.

Best regards,

Jianke Wang, Ph.D., P.E.
Senior Project Engineer
ISO Vibration Analyst IV
National Oilwell Varco
2800 N Frazier St
Conroe, TX 77303
Tel: 936-523-2634
Fax:936-523-2788