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Working Party on the Transport of Dangerous Goods

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VESSELS

Heat treatment

Transmitted by the European Liquefied Petroleum Gas Association (AEGPL)

SUMMARY

Executive summary: The French Government recommends a heat treatment of tanks in fine grains for the transport of gases. AEGPL sets out some limits of utilization of heat treatment.

Action to be taken: Amend the RID/ADR requirements in line with standard EN 12493:2001.

Related documents: ECE/TRANS/WP.15/AC.1/2007/54.

Comments

Regarding the post-weld heat treatment, the LPG industries have codified their best practices in the Standard EN 12493: 2001 « Welded steel tanks for liquefied petroleum gas (LPG) - Road tankers - Design and manufacture ».

Post-weld heat treatment (PWHT) is used to improve the properties of a welding. In general, when it is required, the goal is to increase the resistance to brittle fracture and relaxing residual stresses. The two most common procedures used are Post Heating and Stress Relieving:

- Post Heating is used to minimize the potential for hydrogen induced cracking and is not required for most applications. Post Heating is required when a potential hydrogen cracking problem exists due to sensitive base metal microstructure.
- Stress Relieving is used to reduce the stresses that remain locked in a structure as a consequence of manufacturing process. This technique redistributes the dimensional reliability which has been modified during manufacturing and reduced hydrogen induced cracking. The steel becomes softer and more ductile by increasing its tensile strength (its ability to support a load without breaking).

When determining whether or not to PWHT, the alloying system, previous heat treatment and the specific application of the base metal must be considered: the post-weld heat treatment can cause benefit but may also damage the metal tensile strength in case of i.e. certain filler metal specification or inappropriate temperature range applied during the PWHT. That is the reason why a PWHT is not requested in the Standard EN 12493: 2001 « Welded steel tanks for liquefied petroleum gas (LPG) - Road tankers - Design and manufacture » as this standard requests specified steel grades preserving their mechanical strength during welding and manufacturing. These steel grades are defined in the standard EN 13 445 “*Unfired pressure vessels*”.

Proposal

AEGPL proposes to add the following text to the proposal made by the Government of France:

“This provision is not applicable in case of material specially designed to withstand manufacturing stresses,”
