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Surveillance of properties by destructive testing of samples taken out of service

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Introduction

Document ECE/TRANS/WP.15/AC.1/2013/43 proposes additional new paragraphs to 6.2.3.5.3.

The character of these “over-moulded cylinders” implements that the conditions of the outer surface of the load carrying steel receptacles cannot be checked without removing the over-moulding as this would lead to the destruction of the pressure receptacle. Therefore major parts of the proposed wording try to describe a substitution by non-destructive tests such as visual inspection or hydraulic test. The concluded and presented solution is basically to pick up samples from the population of pressure receptacles in service and test them destructively. This approach take into consideration that the relevant properties are more related to a general degradation of properties of cylinders and uncertainties on the prediction of long term behaviour of a population than related to individual conditions of a pressure receptacle.

Some of the proposed changes include values being essential for the level of safety. Nevertheless, it is proposed to refer to standards, only.

One of these issues is the table of annex G of EN 1440: 2008+A1:2012, which has been used in the "Multilateral Agreement M 247 under section 1.5.1 of ADR concerning the periodic inspection of some steel cylinders intended for the carriage of liquefied petroleum gas (UN 1965)" initiated by France and Belgium. This table deals with the minimum number of specimens to be tested destructively.

Another reference with essential influence on safety level is ISO 16269-6:2005 "Statistical interpretation of data — Part 6: Determination of statistical tolerance intervals". This standard is intended to be used for setting right unilateral statistical tolerance interval.

Such a procedure is already part of multilateral agreement M 247 and of an informal annex (related to composite-LPG-cylinders) of a referenced standard. Nevertheless, the implementation of these references in ADR/RID means the introduction of a completely new approach.

Germany welcomes this approach in general and uses a similar approach for life time surveillance of composite cylinders as well. Nevertheless, such a statistical approach is very complex and may become difficult in interpretation as soon as statistics have to be based on a mixture of distribution density functions or if early failures have to be taken into consideration.

Proposal

Therefore Germany is of the opinion that it is needed to set relevant safety values in RID/ADR itself. The approach should be worded in a more general way and may be (partly) inserted in packing instruction P 200 since it is linked to the question of retest periods. Consequently it is proposed to treat this important issue in a way as the Joint Meeting already decided concerning the retest periods of 15 years for welded LPG-cylinders and for some non-welded pressure receptacles.

Germany proposes to install an informal working group for the discussion of this issue and for the preparation of a proposal.
