BAM
Bundesanstalt für Materialforschung und -prüfung

Sicherheit in Technik und Chemie

March 2019

COMMENTS ON DOCUMENTS

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GTR 13 Phase 2 WG - 5th Meeting, Vancouver

Acceptance criterion for RC&S

The benchmark for acceptance of a standard or of technical requirements in a regulation is its power to ensure safety of all products meeting the minimum requirements of a regulation or standard;

– despite of the experience of potential manufacturers.

Four aspects of safety in gas storage

PA
Probabilistic Safety Assessment

The status of safety is reached when an undesirable event does not occur more frequently than is accepted.

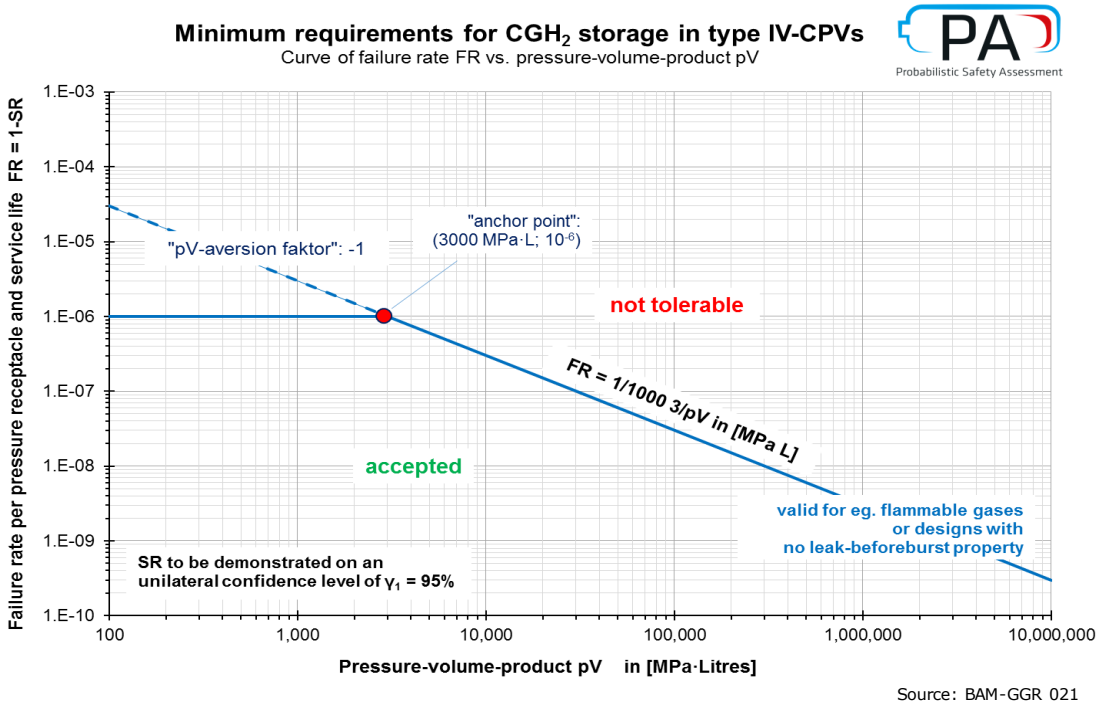
Acceptance criterion for RC&S

1. **The current discussion about right-turning lorries killing bicycle riders in Europe shows:**
   The acceptance of fatalities not being passengers is much lower than of death passengers.

2. **It is not worth to discuss details on incidents expected with a frequency lower than the accepted failure rate.**

Determination of safety level

Based on German requirements for the transport of dangerous goods



Source: BAM-GGR 021

TANK HYDROGEN AUTOMOTIVE

This EU-project decided in 2018 to address a maximum failure rate of 2 of 10 Mio CPVs during life time up to a pV of about 150 litres@875 bars

Comments on the documents
GTR13-5-03

- We do not share the recommendations for widening the temperature ranges during test. This is contradictory to the approach of determining means strength and defining a accepted scatter range.

- It is no correct to presume outdoor tests: burst tests and drop tests should take place indoor as hydraulic cycle tests and sustained load tests do.

- A burst test running for just a few minutes shows too high strength values.

Comments on the documents

GTR13-5-12

- BAM was partner in the HyComp-project, too and uses the definition of safety factors as shown on slide 16. Define the probability of overfilling before defining the maximum service pressure!

- We do not support a further reduction of burst ratio without adequate measures with respect to production scatter and in service degradation.

- As indicated on slide 18, the influence of time for reduction of burst strength on cylinders is different than on flat probes.

- The development of NDT for QM etc. is important. Operated evaluation procedures of test results have to be traceable, reproducible able and transparent to all experts.

Comments on the documents
GTR13-5-13

- Interesting test results
- Keep the test procedure as reproducible as possible. The influence of wind etc. has to be limited to the absolute minimum.
- We propose to introduce a “reference test vessel” that allows to calibrate the heat flux of the source into this reference for relevant equipment.

Comments on the documents
GTR13-5-14

- Define the probability of getting HFCVs exposed to fire!
- What is the likelihood for getting exposed to fire in a garage?
- If this is below 1 of 1 Mio it is not worth to consider this combination of condition. If it his higher take into consideration regulations valid for garages.
- We accept limited gas release through the walls, especially as a kind of redundancy. But we do not support measures that are in contradiction to the important purpose of a blow-off line. No support of proposed chances.

PA Probabilistic Safety Assessment


thank you
danke
謝謝
gracias
merci
obrigado
dziękuję
bedankt
go raibh maith agat
teşekkür ederim
ngiyabonga
спасибо
Баярлалаа
рахмат
dank je
tapadh leat
mochchakkeram
hvala
mauruuru
sukriya
kop khun krap
terima kasih
감사합니다
ευχαριστώ
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তোমাকে ধন্যবাদ
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gràcie
kosziönöm
didi madloba
rahmat