

13th IWG GTR 13
Side meeting on PRD

Annett Schuessling, OICA

TPRD direction

5.2.1.3.1. Pressure relief systems (para. 6.1.6. test procedure)

(a) Storage system TPRDs.

The outlet of the vent line, if present, for hydrogen gas discharge from TPRD(s) of the CHSS storage system shall be protected from ingress of dirt and water (e.g. by a cap);

(b) Storage system TPRDs.

The hydrogen gas discharge from TPRD(s) of the CHSS storage system shall be directed such that the hydrogen exhaust does not impinge upon:

- (i) enclosed or semi-enclosed spaces;
- (ii) any vehicle wheel housing;
- (iii) hydrogen gas containers;
- (iv) the vehicle's REESS.

Question for other PRDs

Should the same language be used for other pressure relief devices?

- (c) Other pressure relief devices (such as a burst ~~disc-disk~~) may be used outside the ~~CHSS-hydrogen-storage system~~. The hydrogen gas discharge from other pressure relief devices shall not be directed:
- (i) Towards exposed electrical terminals, exposed electrical switches or other ignition sources;
 - (ii) Into or towards the vehicle passenger or ~~cargo~~**luggage** compartments;
 - (iii) Into or towards any vehicle wheel housing;
 - (iv) Towards hydrogen gas containers;
 - [(v) Towards the vehicle's REESS.]**

Consensus by side-meeting participants (March 15, 2022)

5.2.1.3.1. Pressure relief systems (para. 6.1.6. test procedure)

- (a) The hydrogen gas discharge from TPRD(s) of the CHSS shall be directed such that the hydrogen exhaust does not impinge upon:
 - (i) enclosed or semi-enclosed spaces;
 - (ii) any vehicle wheel housing;
 - (iii) hydrogen gas containers;
 - (iv) the vehicle's REESS.
- (b) The outlet of the vent line, if present, for hydrogen gas discharge from TPRD(s) of the CHSS shall be protected from ingress of dirt and water (e.g. by a cap).
- (c) **deleted**

5.2.1.4. Protection against flammable conditions: single failure conditions

- 5.2.1.4.1. Hydrogen **gas discharge**, leakage and/or permeation from the ~~hydrogen storage~~ **vehicle fuel** system shall not directly vent into the passenger, or luggage, or cargo compartments, or to any enclosed or semi-enclosed spaces within the vehicle that contains unprotected ignition sources.

Rationale for paragraph 5.2.1.4.1.

- 1) There are NOT exhausts from the ultra-high pressure CHSS. **These potential hydrogen gas discharges are ~~PRDs are PSVs, etc.~~ below from pressure relief valves (PRVs) at low pressure, downstream of** the high pressure regulator, so the lengths of plumes can be very short.
- 2) Low pressure releases may not ignite immediately at the exhaust point, so the concept of dilution to below flammability is possible in many situations. Therefore, what we are trying to avoid is the exposure of flammable gases (fundamentally >100% LFL) to ignition sources (such as hot surfaces above auto-ignition temperature and arcing-sparking motors, electrical switches, etc).

Based on the above, the exhausts from these low pressure ~~PRDs~~ **PRVs should not be directed into spaces where flammable gases can contact ignition sources.**