

**Opinion on the “UN-R134_03 Supplement
Proposal: Supply Lines for Additional TPRDs
– ISO 19887-1:2024 Alternative Requirements
(Informal Industry SG)”**

(GRSP TFH2 on February 25, 2026)

Transmitted by METI / KHK (Japan)

I. Introduction

- The proposal from the Informal Industry SG intends to apply ISO 19887-1:2024 to supply lines for additional TPRDs, as an alternative to “demonstrated mechanical integrity and durability as part of qualification tests for the container (verification tests for baseline metrics in paragraph 5.1., hydraulic sequential test in paragraph 5.2. excluding the drop test” under the UN-R134 03 series for CHSS.
- Therefore, we have considered whether this proposal could be accepted.

II. Issues with Applying ISO 19887-1 as an Alternative

1. Scope

- ISO 19887-1 states as follows:

“1.3 Exclusions

This document does not apply to the following:

- a) hydrogen gas fuel system components incorporated during the manufacture of motor vehicles originally manufactured in compliance with the international regulations on hydrogen and fuel cell vehicles, such as UN GTR No. 13, UN Regulation No. 134, UN Regulation No. 146, or IEC 62282-4-101;”
- In response, the Informal Industry SG explains: “Reason for Exclusion: the exclusion applies only to two components [check valve and shut off valve] ...”
- However, it is not described in the standard that only check valves and shut-off valves are excluded. It clearly excludes from its scope all CHSS components to which UN-R134 applies.
- In addition, the standard sets its requirements based on 4.1.1 “Intended use”, which requires consideration of the intended installation location and pressure class, such as the first stage of pressure reduction, NWP/MOP, and filling cycle/duty cycle. These conditions are defined for components outside the CHSS and are therefore not applicable to a supply line between the TPRD and the container, which is part of the CHSS.

II. Issues with Applying ISO 19887-1 as an Alternative

2. Tests for Fittings

- Regarding the following provision, the Informal Industry SG explains that “ISO 19887-1 Fittings (clause 22) will be included in proposed UN-R 134 requirements.”

19.3 Tests

19.3.1 General

The raw tube material used for rigid fuel lines shall be tested as per Table 15. When possible, tubing and fittings shall be tested together as a sub-system.

- In addition, the Informal Industry SG explains that “the tube and fittings used for supply lines for additional TPRDs may be tested together as a sub-system per the ISO 19887-1 requirements clause 19 (Tubes) and clause 22 (Fittings).”
- However, the test configuration of the “sub-system” and the applicable test items are unclear. For example, it is not specified whether the “excess torque resistance” in 5.4 applies to the sub-system.

3. Issues with Raw Tube Testing

- Raw tube testing, described by the Informal Industry SG as “Straight tubing samples with fittings”, does not evaluate the effects of manufacturing processes such as bending, welding, or heat treatment. Therefore, it cannot be considered a representative type test of the final product.

II. Issues with Applying ISO 19887-1 as an Alternative

4. Material Compatibility

- ISO 19887-1, 19.3.2 “Continuous operation” for rigid fuel lines states: “Testing with hydrogen gas for the continuous operation test may be used to demonstrate hydrogen compatibility for hydrogen environments as anticipated in service.”
- This approach is not aligned with the material compatibility approach that has been discussed in relation to GTR13 and UN-R134.
- Material compatibility is expected to continue to be discussed in relation to GTR13 and UN-R134.
- Therefore, it would not be appropriate to introduce such a standard at this stage.

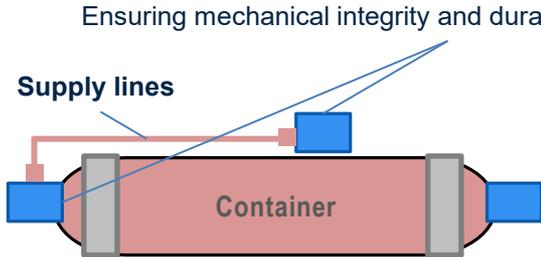
5. Number of Cycles

- ISO 19887-1 specifies, as stated in 4.1.5 “Design service life”, a design service life of 20 years.
- UN-R134 specifies a design service life of 25 years.
- Although ISO 19887-1 allows extension of service life by multiplying the number of cycles (e.g. by 1.25 for 25 years), it is unclear which tests are subject to this adjustment. For example, in the case of rigid fuel lines, it is not specified whether this applies to continuous operation (19.3.2), corrosion resistance (5.7), or both of these tests.

III. Equivalence to the Hydraulic Sequential Test and Others

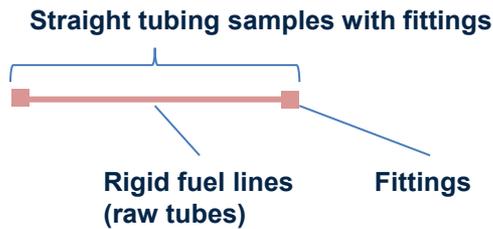
1. Comparison with the UN-R134 03 series

- The Informal Industry SG explains that “**Tubing in its final shape is tested in the UN-R 134 key functionality tests: pneumatic sequential and localized fire**”. However, these tests in UN-R134 are not intended to demonstrate mechanical integrity and durability as part of qualification tests for the container.
- The Informal Industry SG explains that “**Straight tubing samples with fittings are appropriate test pieces**”, but the test is conducted separately from the container.
- Therefore, it cannot be considered equivalent to the verification tests for baseline metrics (5.1) and the hydraulic sequential test (5.2) under UN-R134. These tests are performed with the container and supply line connected through an appropriate adaptor, thereby also demonstrating the mechanical integrity and durability of their connection.



 : **Appropriate adaptor**
a test component that substitutes for the container valve or end plug and includes an outlet with the proper fitting size and geometry to connect the supply line to the additional TPRD.

UN-R134 03 series (5.1, 5.2) Test Setup



Test fixture unclear.

Alternative Test Setup

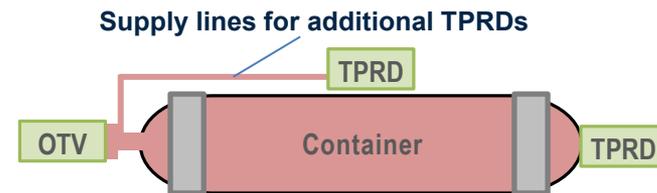
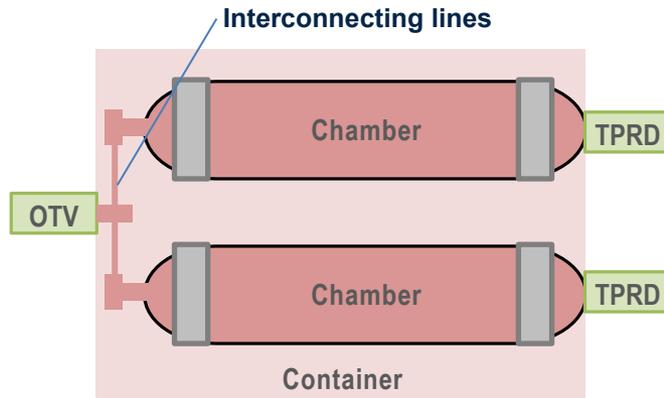
III. Equivalence to the Hydraulic Sequential Test and Others

2. Supply Lines vs. OTVs / TPRDs

- The Informal Industry SG explains that “OTV and TPRDs are also subjected to the same pressure level and life requirements as the container and are not included in the hydraulic sequential test, not practical to include them” It also explains that “OTV and TPRDs have their own testing requirements outlined in UN-R134, In such a case, the supply lines will not be tested in the hydraulic sequential test but will be included as part of CHSS in pneumatic sequential test and bonfire test.”
- However, a supply line forms a continuous pressure volume with the container. Its integrity should be evaluated in the connected condition with the container, based on the current GTR13 Phase 2 approach.
- In contrast, OTVs / TPRDs do not form part of this continuous pressurized volume. Their evaluation focuses on functional performance and durability as individual components.
- On this basis, supply lines and OTVs / TPRDs are treated differently under GTR13 / UN-R134.

IV. Safety Concept Underlying the Current GTR13 / UN-R134

- The fundamental safety concept of GTR13 / UN-R134 is the containment within the CHSS, in order to isolate the hydrogen from the surroundings and downstream systems (GTR13 Phase 2 Part 1, 50.).
- Based on this concept, GTR13 Phase 2 Part 1, 51. specifies that “any additional TPRDs should be connected directly to the containers by using supply lines that have demonstrated mechanical integrity and durability as part of qualification tests for CHSS (paragraphs 5.1.1. and 5.1.2.)” This requires that parts forming a pressure volume connected to the container within the CHSS be tested in the connected condition with the container.
- Therefore, supply lines are not general piping outside the primary pressure boundary, but are considered part of the CHSS.



Interconnecting lines of conformable tanks located within the primary pressure boundary are considered part of the containers. Supply lines should be treated consistently.

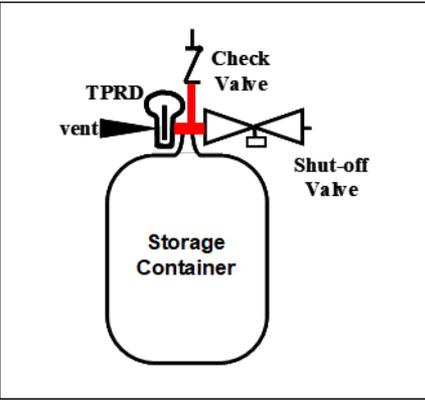
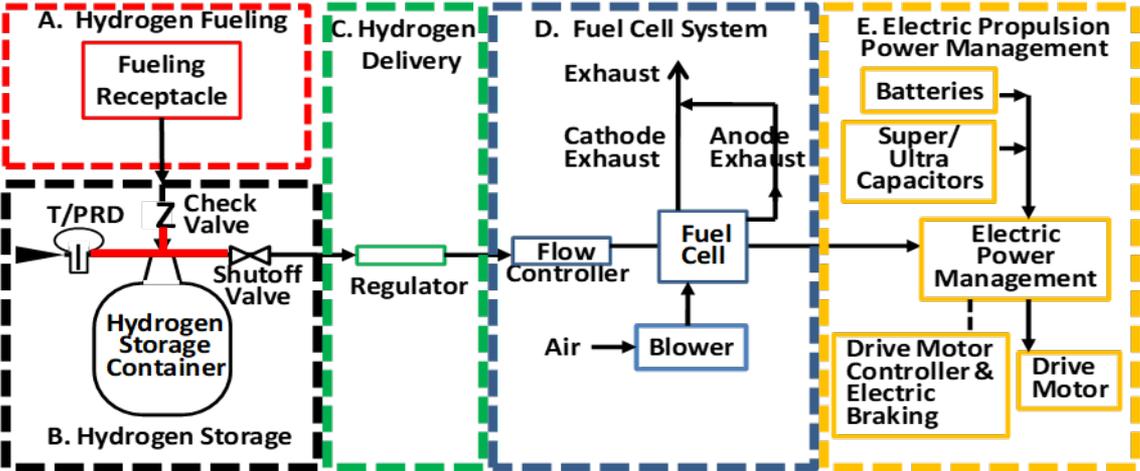
IV. Safety Concept Underlying the Current GTR13 / UN-R134

• (Reference) Handling of Supply Lines under FMVSS

Federal Motor Vehicle Safety Standards; Fuel System Integrity of Hydrogen Vehicles; Compressed Hydrogen Storage System Integrity; Incorporation by Reference

4. Compressed Hydrogen Storage System, A. Container Definition, Agency Response

Additionally, it is important to include the word “continuous” in the definition. This word is used to determine the specific volume that constitutes a container's single or multiple permanently interconnected chambers. **The continuous volume that constitutes the container continues until it is “interrupted” or “broken” by a shut-off valve. Any continuous volume up to the shut-off valve is considered part of the container. For example, if there are lines [9] between a cylindrical chamber and the shut off valve, then those lines are considered part of the continuous volume that constitutes the container with hydrogen stored at high pressure.**



IV. Safety Concept Underlying the Current GTR13 / UN-R134

• (Reference) Handling of Supply Lines under FMVSS (continued)

5. General Requirements for the CHSS

B. Mounting Closure Devices On or Within Each Container

Agency Response

NHTSA will not require closure devices to be mounted on or within each container. As discussed above, the definition of “container” in the final rule is sufficiently broad to include any lines that may form part of the container's continuous volume of pressurized hydrogen up to the closure device.^[15] Therefore, these lines must be included in the applicable performance testing as part of the container itself. If a container, including all portions of the container's continuous volume, can successfully complete the performance testing in FMVSS No. 308, then the risk of failure of the lines has been sufficiently addressed.

Under FMVSS, based on GTR13, the piping up to the closure devices (TPRD, check valve and shut-off valve) is clearly defined part of the container.

V. Conclusion

1. Since UN-R134 is a UN Regulation, it establishes performance-based safety requirements intended for uniform application worldwide. Therefore, it is not appropriate to introduce alternative provisions that would result in different performance levels.
2. ISO 19887-1 was not developed for piping located within the CHSS to which UN-R134 applies. In addition, testing as “Straight tubing samples with fittings” is not sufficient as an alternative to the hydraulic sequential test and related tests under UN-R134.
3. This proposal would change the current approach of GTR13 / UN-R134, under which components up to the primary pressure boundary are verified together with the container.

- **Because of the above reasons, it is not appropriate at this stage to apply ISO 19887-1:2024 to the supply lines regulated under UN-R134.**
- **Before such application can be considered, ISO 19887-1 should be revised to reflect its proper scope and the current safety concept for CHSS under GTR13 / UN-R134.**
- **Accordingly, this proposal cannot be accepted at this stage.**