Informal document **VIAQ-21-03**

Progress Report of the VIAQ (Vehicle Interior Air Quality) Informal Working Group

Webex, January 11th 2021

Chair: Andrey KOZLOV, Russian Federation

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Secretary: Andreas WEHRMEIER, BMW

Background

Proposal for Amendment 1 to Mutual Resolution No. 3.
ECE/TRANS/WP.29/2020/124
was adopted by 182nd session WP.29 which was held 10-12 November 2020 (agenda item 4.17.1)

United Nations ECE/TRANS/WP.29/2020/124

Economic and Social Council

Distr.: General
26 August 2020

Original: English

Economic Commission for Europe

Inland Transport Committee

World Forum for Harmonization of Vehicle Regulations

182nd session
Geneva, 10-12 November 2020
Item 4.17.1. of the provisional agenda
1958 Agreement:
Proposals for amendments to Mutual Resolution

Proposal for Amendment 1 to Mutual Resolution No. 3 Concerning Vehicle Interior Air Quality (VIAQ)

Submitted by the Working Party on Pollution and Energy*

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its eighty-first session (ECE/TRANS/WP.29/GRPE/81) and is based on ECE/TRANS/WP.29/GRPE/2020/16. It is a proposal for an amendment to Mutual Resolution (M.R.3) of the 1958 and the 1998 Agreements concerning Vehicle Interior Air Quality (VIAQ). It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Executive Committee (AC.3) of the 1998 Agreement for consideration at its November 2020 sessions.

VIAQ IWG Meetings

- **20th VIAQ IWG Meeting**
  - Webex, 10th November 2020
  - Half a day

Third Stage

Terms of reference and rules of procedure for the Informal Working Group on Vehicle Interior Air Quality (VIAQ)

Informal document GRPE-81-09

1. Background

1.1 VIAQ informal working group developed a new Mutual Resolution No.3 on Vehicle Interior Air Quality taking into account emissions of chemical substances from the interior materials. This issue is linked to evaporative emissions from chemical compounds used in some of the vehicles' interior elements, such as the dashboard, seat etc. The mutual resolution contains provisions and harmonized test procedures for the measurement of interior air emissions from interior materials.

1.2 On the second stage, exhaust gas entry from the tailpipe of the vehicle is taken into account. The amendment of Mutual Resolution No.3 contains provisions and harmonized test procedures for the measurement of interior air pollution from exhaust gases of a tested vehicle. The list of test substances includes CO, NO, and NO_2.

1.3 Another, probably most important, source of interior air pollution is ambient air, which could contain many harmful substances emitted by other vehicles, power plants, industry etc. The group considered the inclusion in the scope of interior air pollutants from outside sources as a possible extension of the mandate at third stage. As an extension of the existing Mutual Resolution on VIAQ, this will take into account not only interior air emissions generated from interior materials and exhaust gases from the vehicle entering into the cabin but also outside air pollution sources. The list of outside air pollutions could include CO, NO, NO_2, SO_2, O_3 volatile organic compounds (VOC), aldehydes, aromatic and aliphatic hydrocarbons, particulate number (PN) and mass (PM) and microbiological substances, e.g. allergens, fungi, bacteria and viruses. As an extension of the existing Mutual Resolution on VIAQ, this will take into account not only interior air quality but also the air cleaning efficiency of the vehicle air handling & treatment system.

2. Procedural Background

2.1 At the 173rd WP.29 session Proposal for a new Mutual Resolution (M.R.3) for of the 1958 and the 1998 Agreements concerning Vehicle Interior Air Quality (VIAQ) was adopted (ECE/TRANS/WP.29/2017/136). Final text of Mutual Resolution M.R.3 was published at UNECE site on 1 of November 2018 as the document ECE/TRANS/WP.29/1143

2.2 At the 172nd WP.29 session, WP.29 endorsed the extension of the mandate of the IWG on VIAQ until November 2020 to extend the work to consider not only emissions generated by interior materials, but also exhaust gases from the tailpipe that enter into the vehicle cabin. (ECE/TRANS/WP.29/1131, para44)

2.3 At the 80th GRPE session, the Chair of the IWG on Vehicles Interior Air Quality presented the draft amendment of Mutual Resolution No. 3 (GRPE-80-21) and requested an extension of the mandate of the IWG on VIAQ until November 2025 to expand the work to consider interior air pollution from outside sources. (ECE/TRANS/WP.29/GRPE/80, para 67)

3. Objective

3.1 The VIAQ informal working group will have an open structure, which will enable the exchange of information and experiences on relevant regulations, policy measures and harmonization efforts.

3.2 This proposal expands on the issues of the vehicle interior air quality, addressing outside air pollutants entering into the vehicle cabin and the interior air cleaning efficiency, to develop a test procedure in a recommendation by including Part 4 in the Mutual Resolution No. 3.

4. Terms of reference

4.1 The following terms of reference describe the main tasks of the IWG.

(a) Identify and collect the information and research data on outside and interior air quality and its relevance for vehicles, taking into account the activities being carried out by various governments, and non-governmental organizations.

(b) Identify and understand the current regulatory requirements with respect to vehicle interior air quality and incoming air cleaning efficiency in different markets.

(c) Identify, review and assess existing test procedures suitable for the measurement of harmful substances while entering into the vehicle cabin and the interior air cleaning efficiency (including test modes, sample collection methods and analysis methods, etc.)

(d) Develop provisions and test procedures in a recommendation by including Part 4 in the Mutual Resolution No. 3.

5. Timeline

5.1 The work of the group on Vehicle Interior Air Quality should be completed by November 2025. An extension of the mandate of the group should be considered in due time by GRPE, if necessary.

(a)	January 2021:	Discussion for the directions and working items. Data collection and analysis
(b)	January 2022:	Analysis of existing test procedures
(c)	June 2022:	Report to GRPE Concept of test procedure, and inform GRPE on future activities from July 2022 to November 2025
(d)	January 2023:	Tests by VIAQ IWG members
(e)	January 2024:	Start working with draft document and verify test procedure
(f)	January 2025:	Submit the draft document to GRPE
(g)	June 2025:	Adoption of the draft document by GRPE
(h)	November 2025:	Adoption of the draft document by WP.29

6. Scope and work items

6.1 Interior air emissions emitted from interior materials

(a) Continue to work, review, and assess the harmonized test procedures

(b) Update the interior emissions section 2 for the Mutual Resolution

6.2 Substances from exhaust gases entering to the vehicle cabin

(a) Continue to work, review, and assess the harmonized test procedures

(b) Update section 3 for the Mutual Resolution

6.3 Outside air pollutants entering into the vehicle cabin and their cleaning efficiencies

(a) Collect the information and research data on relevant air pollutants and similar issues, and understand the current regulatory requirements with respect to vehicle interior air quality in different markets.

(b) Review, assess and develop new test procedures suitable for the measurement methods of air pollutants entering into the vehicle cabin and their cleaning efficiencies (including test modes, sample collection methods and analysis methods, etc.)

(c) Discuss the potential of air pollutants in the vehicle interior air with toxicologists.

(d) Develop a draft for test procedures in a recommendation.

7. Rules of procedure

7.1 The following rules of procedure describe the functioning principles of the informal working group.

(a) The IWG is open to all participants from any country or organization of WP.29 and its subsidiary bodies. A limitation of the number of participants for the IWG is not foreseen.

(b) A Chair (Russian Federation), a vice chair (Republic of Korea) and a secretary (OICA) will manage the IWG.

(c) The official language of the IWG will be English.

(d) All documents and/or proposals shall be submitted to the secretary of the group in a suitable electronic format, preferably in line with the UNECE guidelines in advance of the meetings. The group may refuse to discuss any item or proposal, which has not been circulated 5 working days in advance of the scheduled meetings.

(e) The informal group shall meet regularly in conjunction with the GRPE sessions, presuming the availability of meeting rooms. Additional meetings will be organized upon demand.

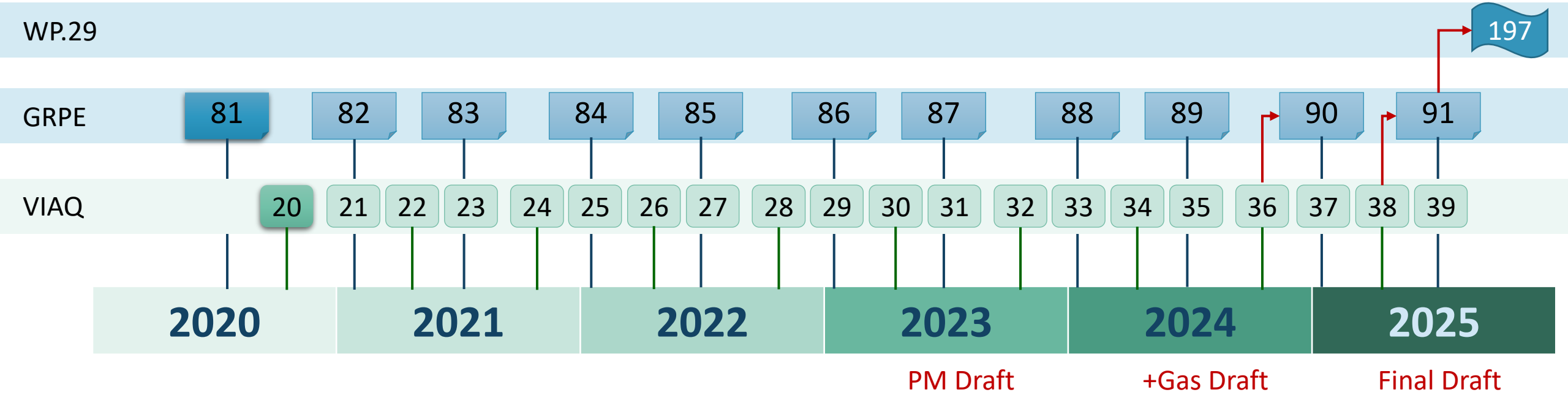
(f) An agenda and related documents will be circulated to all members of the informal working group in advance of all scheduled meetings.

(g) The work process will be developed by consensus. When consensus cannot be reached, the Chair of the informal group shall present the different points of view to GRPE. The Chair may seek guidance from GRPE as appropriate.

(h) The progress of the informal group will be routinely reported to GRPE orally or as an informal document by the Chair or the secretary.

(i) All working documents shall be distributed in digital format. The specific VIAQ section on the UNECE website shall continue to be utilised.

Timeline



Data collection

Analysis of existing test procedures

Tests by VIAQ IWG members

Developing of harmonized test procedure

Stage 3. Phase 1

Stage 3. Phase 2

The objective and tasks for the Phase 1

Objective:
globally: development of a harmonized (at the UN level) methodology for assessing the effectiveness of air cleaning in the cabin of a complete vehicle
1 phase of work: development of a methodology for the concentration of particles measuring in the passenger compartment of a car in real driving conditions and assessment of the effectiveness of the cabin air cleaning systems regarding particles

Tasks:
1. Development of the draft of the test procedure
2. Carrying out field experiments on various vehicles in various driving conditions with various settings / configurations of the interior ventilation system
3. Analysis of the obtained data (with the development of the method of post-processing of the data), their submission for consideration in the VIAQ group
4. Development of a methodology for measuring the concentration of particles in the passenger compartment under real driving conditions
5. Analysis of the data obtained with an assessment of the effectiveness of the cabin air cleaning system
6. Development of a methodology for assessing the effectiveness of a cabin air cleaning system for a car regarding to particles in real driving conditions
7. Presentation of the methodology and results of experimental studies on the VIAQ group

The parameters/factors under investigations

1. Repeatability of the results obtained when driving the same vehicle along the same route with the same ventilation system settings
2. Investigation of the influence of atmospheric humidity on the measurement results
3. Study of the influence of traffic conditions on measurement results (city, suburb, highway) - following the RDE test methodology (Document: ECE/TRANS/WP.29/GRPE/2020/15)
4. Tests when driving with / without a cabin filter, driving with opened window (s)
5. Study of the influence of the settings of the interior ventilation system:
   - Recirculation ON / OFF
   - Fan speed
   - Air conditioner ON / OFF
   - Interior temperature settings
6. Studies of the influence of a sampling point / line on measurement results
7. Study with cabin filters of various quality/manufacturers

Working Items

I. Common items

1.Vehicle Category 

2.Test Vehicle age/millage

3.Meteorological Conditions

4.Test Conditions

5.Sampling Points

6.Background air pollution level

7.Cabin air filter age

II. PM items

1.PM sizes to be Measured

2.Test Modes

3.HVAC Modes

4.Test Procedure

5.Measurement Methods

6.Test equipment requirements

7.Test Protocol Form

III. Gaseous components items

1.Substances to be Measured

2.Test Modes

3.HVAC Modes

4.Test Procedure

5.Measurement Methods

6.Test equipment requirements

7.Gas analyzers calibration

8.Test Protocol Form

Next VIAQ IWG Meetings

- **22nd VIAQ IWG Meeting (TBD)**
  - Brussels, Belgium, April, 2021
  - or Paris, France, April, 2021
  - Two days
- **23st VIAQ IWG Meeting (TBD)**
  - Geneva, Switzerland, June, 2021
  - Half a day