

DRAFT REPORT

Informal working group on Acceleration Control for Pedal Error 4th meeting

21, 22, 24 November 2023
in Tokyo, Japan,

Venue: AP ICHIGAYA
Tokyo
IWG wiki page: [Link here](#)

1. Welcome and Introduction

The chairs started by solving some housekeeping issues:

- The meeting room is available from 8:45 am until 6:15 pm
- The meeting will start on Wednesday at 9:15 am.
- Only microphones can be understood by the experts attending from exterior
- Party kindly offered by JASIC will start at upper floor at 6:00 pm on 21 November

Japan welcomed the participants and thanked those coming from abroad. The chairs thanked JASIC for their organization and the party.

The chair organized a tour de table of the attendees.

2. Approval of the agenda

Document: ACPE-04-01 (Chair)

The agenda was adopted with the changes per the document ACPE-04-01-r3

3. Adoption of the report of the 3rd meeting of the Informal Working Group

Document: ACPE-03-15 (Chair and Secretary)

The report was adopted with no change.

4. Discussion for draft proposal of ACPE regulation based on the result of 3rd IWG for first step

Documents:

- ACPE-03-14 (Chair and Secretary)
- ACPE-04-04 (UK) Test procedure
 - Para. 5.1.10, 6.3.3, 6.3.4, 6.5, 6.6 and 6.7
- ACPE-04-05 (UK) Warning, Deactivation, Failure detection and PTI
 - -Para. 5.1.7., 5.2, 5.3, 5.4 and 5.5
- ACPE-04-06 (OICA/CLEPA) Deactivation means
 - Para. 5.2
- ACPE-04-07 (OICA/CLEPA) Position overview
 - Para. 1, 5.1.1, 5.1.3, 5.1.7, 5.1.9, 5.2, 5.3, 6, 6.3.2, 6.5 and 6.7
- ACPE-04-08 (OICA/CLEPA) JNCAP test procedure outline
 - Para. 6
- ACPE-04-09 (OICA/CLEPA) Pedestrian application plan
 - Para. 5.1.1 and 6.3.2
- ACPE-04-10 (OICA/CLEPA) Performance requirements
 - Para. 5.1.3

- ACPE-04-11 (OICA/CLEPA) Vehicle category proposal
 - Para. 1
- ACPE-04-12 (Korea) Korea automobile accident statistics analyzing
 - Para. 1
- ACPE-04-13 (UK) Explanatory presentation
- ACPE-04-14 (J) Pedestrians as a 01 Series
- ACPE-04-15 (Industry) Test procedure (ACPE-04-04) concern
- ACPE-04-16 (Japan) Investigation of accelerator pedal application at very low speed
- ACPE-04-17 (Chair) Phase-in timeline and parties positions

Scope:

- ROK presented the document ACPE-04-12
- Industry presented their approach on the accidentology, based on the mileage driven by vehicle category.
- ROK could accept the a scope as Basically M1, + the N1
- D suggested keeping the N1 baed on the accidentology
- UK No strong position, yet tend to support D that those N1 on the road may not change the statistics.
- J repeated their position to add the N1 in
- J pointed out the proposal to introduce the N1 per a new series of amendments.

In general, the contracting parties justified the inclusion of the N1 category by basing the accident rate on the number of registered vehicles (rather than the mileage per vehicle category).

Temporary solution:

- 1.1 This UN Regulation applies to the type approval of vehicles of Categories M1 with regard to their Acceleration Control for Pedal Error (APCE). [**Automatic transmission only**]
- 1.2 At the request of a manufacturer, vehicles other than those mentioned in paragraph 1.1. above may be approved under this Regulation.

The group subsequently reviewed the scope:

The wording at stake is

“2 At the request of a manufacturer, vehicles other than those mentioned in paragraph 1.1. above may be approved under this Regulation.”

ROK supported the wording

D: proposed having M1 in the 00 series, then N1 in the 01 series.

Industry: could accept as long as the adult dummy is the only one in the scope

00 w/o pedestrians

01 with pedestrians

2 years transitional provisions.

Temporary conclusion for adult vs. child dummy:

- Adult-only adopted, child in []
- Industry to make a position until next meeting

Temporary conclusion on phase-in and scope:

- 00 series: M1, w/o pedestrian
- 01 series: M1 + N1, Adult and children pedestrians, 2 year transitional provisions
- 02 series: to be included as a long-term target.

Timeline

Assuming approval at GRVA of May 2024 and at WP.29 of Nov 2024, this would mean

00 series enforced in ~2025 for new types

01 series enforced in ~2027 for new types

The group subsequently reviewed again the question of the scope.

OICA: keen to keep M1 only in the scope since the data do not justify inclusion of other categories. The D data at ACPE-02 in their Slide 5 proposes to limit to M1 only. Seems the new ROK presentation does not motivate either the inclusion of N1 category. Keen that the inclusion of N1 be motivated by data.

D: D data contain only M1, but as a respect to the data provided by other contracting parties, need to include N1. Hence proposal in view of safety is to include N1 in 01 Series.

ROK: N1 category are progressively equipped with auto transmission hence keen that the N1 be included. The chair shared a table comparing the positions of the parties about the inclusion of N1 (see document ACPE-04-17)

Industry clarified that the proposed wording still permits any contracting party to mandate N1 in their territory. In addition, there is a need to deeply review the ROK data because they seem not justify inclusion of N1.

J suggested to ask guidance to GRVA of January 2024 (18th session)

Industry: key criterion is number of vehicles vs. their respective mileage

UK: the criterion is actually the number of moving-off for each category.

The Industry representative demonstrated the relevance of the mileage approach

Debate

ROK: clarified that their concern about N1 category is limited to those equipped with auto transmission.

Conclusion:

- IWG to request guidance to GRVA
- Request for guidance to be edited adequately.

Manual vs. automatic transmission

The group then discussed the concern of the automatic transmission.

ROK: EVs do not have transmission at all

Industry: the problem is the number of pedals. Pedal vs. controls.

Current regulations already refer to automatic transmission.

Temporary conclusion: "... M1 equipped with automatic transmission." + definition of "automatic transmission".

"Automatic Transmission" means any transmission which does not require the use of a clutch control by the driver in order to shift gears (including single gear transmissions, continuously-variable transmissions, and transmissions with an automated clutch).

The definition should name what is included in the regulation rather than excluded

Conclusion: text adopted: inclusion of auto transmission + addition of a definition for auto transmission.

The group agreed to work by reading the document ACPE-03-04r1 paragraph by paragraph.

Definitions:

ACPE

Conclusion: adopted: "Acceleration Control for Pedal Error (ACPE)" means a system to detect misapplication of the accelerator control by the driver and to control unintended acceleration".

AEBS

Conclusion: definition of AEBS removed

Paragraphs 2.3. & 2.4.: removal confirmed

Paragraph 2.5:

Common space: adopted

Moving-off: adopted

Dry road affording good adhesion: debate on the footnote of UN R152: agreed to c/P the paragraphs 2.13 and 2.14 of UN R 152.

See also chat: We also need:

(c) The required value to permit the design maximum deceleration of the relevant vehicle, when measured using the k-test method in Appendix 2 to Annex 13 of UN Regulation No. 13.

Paragraphs 3 & 4:

Industry presented the document ACPE-04-09 as a stepwise approach (vehicle and wall, then pedestrians)

J proposed a new Paragraph 5.1.3.1. for phase A. Similar as Industry: stepwise approach. J was reluctant to introduce 3 series of amendments in one step.

UK: supported the phased approach. Could not understand the argument against the children that ‘it is difficult to detect’.

D was reluctant to give another delay since the 2-step approach is already giving a delay.

Performance requirements (Paragraph 5.1.1)

Review of the text consolidated at lunch time.

“In the case that a collision is not prevented, the collision speed shall be no greater than 8 km/h [higher than the vehicle speed at the point the accelerator control was applied].”

Following any collision, and as long as the obstacle remains in the path of the vehicle, the vehicle acceleration shall continue to be limited by the ACPE such that the vehicle speed does not increase.”

Contracting parties were concerned that a pedestrian having fallen down may not be detected as an obstacle anymore, and ACPE could stop intervening. However the Industry was keen to evaluate the potential negative side effects of the proposal.

Debate

Conclusion:

2 alternatives to be reviewed at next meeting:

“Following any intervention toward a pedestrian, and as long as the obstacle remains in the path of the vehicle, the vehicle acceleration shall continue to be limited [for 5m or 2s] by the ACPE such that the vehicle speed does not increase.”

Alternative text:

“Following any intervention, and as long as the obstacle remains in the path of the vehicle and as long as clear intention of driver override (e.g. two distinct actions, continuous acceleration control for more than [10] seconds) is not detected, the vehicle does not increase. In the case that the system detected driver override by continuous acceleration, vehicle speed shall be increase gradually.”

The group subsequently reviewed the proposal.

Industry: keen that the provisions do not contradict the Vienna Convention, since the driver might find opportune to override system in emergency situations.

UK: section 5.1.8 indeed addresses override, and this is necessary. The expert suggested simplifying the text.

The group finally agreed on the following text:

“Following any intervention, the vehicle acceleration shall continue to be limited by the ACPE for at least [5 m or 2 s]. The intervention may be ended if the obstacle is detected to no longer be present.”

Paragraph 5.1.2.: adopted

Paragraph 5.1.3.

Industry presented document ACPE-04-10 as a proposal for requirement to meet “1. Collision speed” and “2. Speed reduction rate”, both criteria.

Chair: wondered the way to articulate the 2 criteria such that the manufacturer does not select himself the best conditions.

J supported that view

UK pointed out their proposal (document ACPE-04-04, paragraph 5.1.10): impact speed + acceleration inhibited

The chair and J wondered whether the impact speed is not the proper criterion.

J suggested fixing one parameter, like the distance to the obstacle.

OICA found that proposal understandable. UK clarified that one criterion only would not be sufficient.

The group subsequently reviewed the performance requirements.

Collision speed: Industry proposal of 8km/h adopted

Obstacle distance:

- Industry:
 - o range is unclear in terms of harmonization
 - o 1m was related to the 8 km/h, hence a fixed distance of 1,5m would be logical
- UK: keen for a range of distance. If the speed is limited to 8 km/h by the ACPE, then a range is acceptable
- OICA: not if e.g. strong tail wing or descending slope.
- Chair: can be fixed in the technical limitations.

Warning signals – paragraph 5.3.

ACPE-04-05 (UK)

Re-structure. The proposal was generally welcome. Industry requested an in-depth analysis and a review of their proposal ACPE-04-06

ACPE-04-06 (IND)

IND: comes from market experience.

UK: could support the IND proposal

J: could support OICA approach

ROK: supported and understood the interest of a long-term deactivation. Could go along with the OICA/UK/J comments.

There was a debate on the warnings for long term deactivation.

MS TEAMS chat:

[02:34] Japan

may be (b) can be modified like "(b) the driver shall be informed at least [10] second after each new powertrain start/run cycle"

[02:58] Japan as amended during the meeting

new idea "(b) the driver shall be informed that the ACPE function has been deactivated. In this case this information shall be given **for a minimum of [10 seconds] at least every [10] new powertrain start/run cycles**"

IND: need to ensure that there is no need to have 2 separate and different warning signals, rather that the long-term deactivation warning must not be confused with the failure warning:

"The long-term deactivation warning signal shall be distinct from the failure warning signal specified in paragraph 5.4.3."

UK: keen that the long-term deactivation means be more complex than the short term one.

Chair: refer to UN R131.02, paragraph 5.4.1.2., or UN R152.

UK: "The long-term deactivation process shall be designed in such a way that deactivation shall not be possible with less than two deliberate actions."

J: concern about the draft paragraph 5.3.4. (failure detected out of the system boundaries).

Debate on the necessity of keeping such provision vs. informing the driver of the failure at the proper time. [may/shall]

While the vehicle speed is > 10 km/h, the start of the warning [may/shall] be suppressed until the next time the vehicle speed is < 10 km/h → If the vehicle speed is greater than 10 km/h at the time a failure is detected, the warning signal shall be given not later than the next time the vehicle speed is below 10 km/h.

Provisions from UN R152 should also take into account their respective definitions, e.g. definition of "self-check" + reference to the latest series of the UN R152. Paragraph 5.4.2. to 5.4.2.3. to be c/p and worked out in the IWG.

Conclusion: Text improved per the working document (ACPE-04-18)

Warning signal – paragraph 5.4

Interruption by the driver - Paragraph 5.1.7

There was a debate as to whether the word “override” should be introduced into the text, as UN R152 refers to “override” in its introduction, but not in the requirements section.

The UK delegate proposed “abort”, “terminate”.

The group reviewed a proposal by Industry elaborated during a break.

Conclusion: “easy” and “intuitive” removed.

Pedal misapplication test - draft paragraph 6.5

UK presented their proposal per document ACPE-04-04

- “The lateral offset between the centreline of the target and the centreline of the vehicle shall be between 0 and [1] m”
 - o Industry: keen to have the minimum tolerance possible, 1m is far too high
 - o Chair: the tolerance in the test method should not affect the response of the system.
 - o Proposal to use the same overlap as in UN R152, since there is the same reference to ISO 19206-2:2018
- Deviation in the case of a pedestrian target:
 - o Chair challenges the 20 cm deviation since the OEM would fulfil the requirement by simply fitting the sensor in the middle of the vehicle face.
 - o Need to permit robust ACPE with no false positives
 - o J: ACPE is only a supporting system, flexibility is needed.
 - o UK and chair: suggested that the intention of full width detection be ensured.
 - o Suggestion that
 - The offset be 0,2m
 - General provisions stating that the “system shall aim to perform along the full width of the vehicle”.
- Pedal application
 - o Industry presented the outcomes of an ACPE pedal manoeuvre research conducted in Japan (ACPE-04-16)
 - o UK: concerns that the test does not miss a proportion of cases if the test procedure specifies that it starts pedal application at zero and stop it at [90%]. Suggested a provision where there is pedal application of 400%/s for at least 70% of the pedal course.
 - o Chair suggested to add the speed of pedal application as a 4th criterion in the list boundary conditions.
 - o OICA keen that all the provisions (from i to iv) be fulfilled.
 - o Conclusion:
 - Industry to review list taking into account the discussion above
 - Proposal to be added into the board document for revision by the group.

Secondary collision - Paragraph 5.1.9

Conclusion:

- Paragraph deleted
- Item remains in time plan for phase 2 of the informal group.

Test procedure - Paragraph 6

UK presented ACPE-04-04:

- Attempt for definition of a “wall”: the system should have the capability to detect “low walls”, the target should fit the technology
- Current proposal is not sufficiently representative of the real world. Proposal is that the vehicle impacts the target.

Industry: proposed to let the target in the general provisions, as there is currently no harmonized target, then reference to the ISO target;

Chair: keen to have **definitions for wall, vehicle, pedestrian.**

Secr: why is there a need for ACPE avoiding walls, since this is no safety issue related to the walls.

UK: walls often make the limit of areas presenting dangers, like sidewalks, multi-store parking.

Question is to define “obstacle”.

Conclusion: Industry to provide the definition of “obstacles” that is feasible and reasonable.

Deviating conditions - Paragraph 6.5.

IND: concern of reproducibility and reproductibility.

Informal discussions.

Key factor is the **creeping speed** of the vehicles, since the ACPE regulation should not overlap the AEBS regulation, taking account of the safety margin of the OEM.

Conclusion:

- Industry to investigate the creeping speeds of the current production
- NTSEL to provide data

Acceleration profile

UK presented the document ACPE-04-13

Slide 3 shows that only 2 cases in the ROK data (ACPE-03-07) reflect the current text provisions.

Chair: seems the samples (frequency) is not adapted.

ROK: no clue whether the vehicles in the sample (EDR data) are equipped with AEBS.

Debate as to whether the sample is representative of the situation addressed by ACPE.

Need to know the speed profile of the sampled vehicles; the group was seeking to decide on a starting point, yet keeping the conditions close to real world.

Conclusion:

- Further research is needed
- Further steps should investigate the acceleration profile at a frequency > the 2 Hertz.

Test procedure

The group subsequently resumed discussions on the test procedure.

Industry presented the document ACPE-04-15 (Industry concerns about test procedure)

Concern from Industry: lots of questioning points in the proposed procedure, no experience

Debate on whether the acceleration part should start in a region vs. on a defined place.

NTSEL presented the document ACPE-04-16

Seems manual driving permits reaching quite reproducible results.

UK:

- Seems an 0,5m tolerance would exist whatever the test
- Keeps the conclusions of the previous case
- Transmission type influence (Dual-clutch, conventional, hybrid, etc.): need to investigate.

The chair questioned whether some adaptation of the draft text would help Industry accept the NTSEL approach. Industry stressed that, in view of the timeline, the wise solution would be to use well known and experienced test procedures, rather than a totally new one.

The chair recalled that there are good reasons put forward by the contracting parties and technical services that a new procedure should be created. The chair requested Industry to test vehicles according to the test procedure per ACPE-04-04.

Industry was surprised that they have to prove the test method proposed by others. Proposed that those tabling new proposals justify them.

UK: concern that the JNCAP procedure lets vehicles passing the test while providing no safety benefits on the road.

D: supported the idea of collecting data to get a more realistic approach.

Industry and J clarified the origin of the JNCAP procedure that the test must investigate the good functioning of the ACPE. The switch from the braking pedal to the accelerator pedal indeed does not reflect “pedal misapplication”. J supported using the JNCAP procedure at least for the early phase of the regulation.

The chair proposed to put the test procedure in [] and perform in the mean time some test internally following the UK approach.

UK:

- Wondered whether sufficient data can be collected until January IWG meeting
- If the current JNCAP procedure were adopted, need definitely for a statement that the test must be reviewed fast after the adoption of the text.

Industry requested the contracting parties to collect data on several types of vehicles to confirm the new test method.

D supported the approach of a robust test method that brings added value on the field.

The chair recommended to check:

- whether the new test procedure is adequate (reproducible, reproductible, etc.).
- Acceleration characteristics (e.g. vs. several transmission types, etc.) about the 8km/h impact speed
- Would current production fit the proposal of moving-off?

before IWG makes a decision.

J:

- Committed to conduct relevant tests during the winter. Requested Industry to provide the test vehicles.
- Need to have tests from other contracting parties to make the results more representative.
- Confirmed the moving-off approach is interesting, yet keen to respect the IWG schedule (mandate)

ROK

- Supported J
- Understood Industry position that there is no experience of the new test procedure.
- Will provide data as much as possible
- Support moving-off and stationary approach for the moment

UK:

- Supported moving off and stationary
- Will conduct test in the winter
- If the moving-off/stationary approach does not pass through, keen to have nevertheless clear pass/fail and performance requirements.

D:

- Will come with more data at next meeting
- Support the stationary/moving off procedure

Industry:

- Supported the approach proposed

Conclusion:

- IWG to make a decision at next meeting
- All parties to conduct test as much as possible
- Draft text to reflect the state of play

Obstacles (dummies):

All contracting parties were keen that the ACPE functions with both adult and child obstacles.

Industry recalled that there is currently no system capable to react to the pedestrian child dummy. There would need to change the detection system, adapt the production. A deadline in 2027 would be difficult to reach.

Chair: suggested to review the accident data, as to whether it reflects child accidents. Proposed to postpone the item to review accidentology as to whether the children are represented in the statistics.

UK and J: the difficulty to detect children should not be an argument, the children should be protected at least as much as the others.

Conclusion:

- All to check their national statistics
- Review position at next meeting.
- Industry to review their position as rejecting child detection is politically difficult to defend

Obstacle (wall)

The chair questioned the group as to whether a wall obstacle would exist in the future. Proposal to mention it in the performance requirements, yet with no dedicated test procedure.

UK: proposed that the manufacturer provides evidence that the ACPE can detect a wall.

J: supported the above positions.

The chair was keen that a definition of “wall” be added into the list of definitions.

UK: as we want the ACPE to detect obstacles, the delegate proposed to stop referring to a wall, rather to “obstacle”, where the OEM should provide evidence that the ACPE avoids collision to something “smaller” than the targets.

Conclusion:

- Industry to propose a definition of “obstacle”

5. Discussion of concept of ACPE regulation for second step

J informed that USA and CAN approached J at the WP.29 session of November 2023 to discuss the possibility of starting activities for provisions for the contracting parties to the 98 Agreement (GTRs).

Chair: the terms of reference are clear that those contracting parties can join the IWG.

ROK: generally welcome global issues. Yet the delegate questioned the approach in view of the time pressure of the IWG. Suggested that this be discussed at the GRVA plenary session.

Conclusion: item to be discussed at GRVA-18 (Jan 2024).

6. Other business

Homework:

- Industry to collect “final” creeping speed data among existing production (at least one second after the brake control was released)
- BASt to identify the time delay between the triggering acceleration by a driving robot and the pedal acceleration
- Acceleration characteristics vs. the transmission type.
- All (mainly J) to investigate whether ACPE equipped fleet trigger the ACPE intervention on the vehicles that are creeping
- Industry to propose a definition of “obstacle)
- Industry to provide a list of “boundary conditions” (inspired from UN R152)

7. List of action items and next meetings

5th Informal meeting:

Date: 17, 18 January in Web

Time: Start at 8.00 am (CET) on 17th January

Venue: London

Timeline:

The chair tabled the tentative timeline of the group (document ACPE-04-20).

Ultimate target is the adoption of a final official document at the WP.29 session of November 2024.

Conclusion:

- IWG to table an informal document (not finalized) to the GRVA-18 of January 2024
- Ultimate target is the adoption of a final official document at the WP.25 session of November 2024