

DRAFT AGENDA

Informal working group on Acceleration Control for Pedal Error

18-20 September 2024,
in Bergisch Gladbach, Germany,
Federal Highway Research Institute

Venue: Federal Highway Research Institute
BASt (Bundesanstalt für Straßenwesen)
Brüderstraße 53
51427 Bergisch Gladbach
Germany

How to reach the BASt
https://www.bast.de/EN/BASt/Guide/guide_node.html

Time: Start at 11:00 am on 18 September
Finish at 1:00 pm on 20 September

1. Welcome and Introduction

2. Approval of the agenda

Document: ACPE-10-01r2 (Chair)

Agenda adopted without changes.

3. Adoption of the notes of the 9th meeting of the Informal Working Group

Document: ACPE-09-12 (Chair and Secretary)

Notes from 9th meeting adopted without changes.

4. Presentation of accidentology and technical issue

Document: ACPE-10-05 (Korea), ACPE-10-04 (Japan), ACPE-10-15 (Industry),
ACPE-10-06 (Industry)

ACPE-10-05 (Korea):

Korea showed two detailed accident cases, both vehicles not equipped with AEBS.
Japan will investigate their data, if possible they would like to share data with Korea.
For the full version of ACPE-10-05, please contact Korean colleague, since for confidentiality reasons,
only a very short version of the presentation can be uploaded to the website.

Questions:

- Industry: Vehicle A, make/model and equipped with AEB? 2018 Korean vehicle, AEB not fitted.
- Industry: Vehicle B: Only information from Youtube link. Looks like a small K-Car.
- Japan: tragic accident, we may need to collect more information in detail about cases.
- Japan has a question with regard to the collision: In cases where there was a collision first, was the vehicle able to detect this and stop the acceleration?

Conclusion (chair):

- 100% pedal application and pumping important from these cases.
- These cases are non-obstacle cases.

- Not in scope for 01 series. Group might need to consider those at a later point.

ACPE-10-04 (Japan):

Japan presents ACPE-10-04 in three parts:

- First part, experiment to perform forward obstacle avoidance by steering
Preliminary investigation (start timing of AEBS activation)
They investigated the start distance of AEBS
Experiment to perform forward obstacle avoidance by steering
They investigated the influence of steering manoeuvre and AEBS activation.
Their study was the speed of 10km/h, 30km/h, 40km/h in each three vehicles.
J explain the ACPE-10-04 with video.
Summary
No particular reason (advantage) was found to accelerate the vehicle rapidly when avoiding obstacles by steering.

Question:

OICA, agrees with the challenges shown. But the low overlap situations might be more relevant where small changes to the steering wheel and heavy acceleration help.

More important: false positive avoidance is important. When overriding of AEBS is not possible, then functional safety analysis becomes critical.

Japan answered that we consider an overlap ratio, ACPE has an advantage.
Should the AEBS off in case of quick manoeuvre of acceleration?

- Second part, trial of ACPE performance evaluation at steady creeping speed
Investigation of time and distance to reach steady creeping speed
Summary
From the above results, it is confirmed that the method of accelerator pedal application after traveling a predetermined distance is more accurate than the method of accelerator pedal application after traveling a predetermined time.

Question:

Questions: CLEPA, Slide 20, three trials per vehicle for L1 (steady state speed). In that table, what is the spread of the values?

➔ About 0.5 – 1 m of difference.

OICA, very long distance to travel back/forwards. Maybe not necessary to exactly describe the procedure? How to ensure the velocity of the test vehicle?

➔ Japan answered the result will affect the vehicle performance.

CLEPA: Is it realistic to creep for 20 m, 15 s, ...?

➔ Maybe in a large parking lot.

JAMA questions the relevance of long creeping based on accidentology.

Chair: Problem is speed difference between two test runs ➔ error on speed reduction rate

- Part three, ACPE performance evaluation with offset placement of the child pedestrian target
Summary:
The above results confirm that the child pedestrian targets, especially in the backward direction, are not adequately addressed at this stage.

Question:

UK have a question about the direction of the vehicle.

Japan answered that the test condition is shown on slide 27.

Vehicle B was activated the backward condition.

Questions: Creeping procedure? → Yes.
Does the dummy work in forward direction? → Better
DE: Blind spots, robustness needs to be increased
Chair: Forward working quite well, backwards not at all
JAMA: Robust detection is difficult, also camera position.

ACPE-10-15 (Industry):

Test condition:

Industry proposed the distance of creeping (A) and accelerating (B) based on their test.
Chair asked about the activation of accelerator robot, and they answered to decide based on the time.
Industry proposed A is 2.0m and B is 1.5m.
Japan has a question about page 19, they confirmed that if the distance A is decided, the distance B is automatically decided, because triggering condition is by time and/or distance after start.
Chair suggested to perform the activation of robot by reflector, the distance B is fixed.
Industry reacted that the distance B is based on the creeping speed, B is not long.
UK have two comments: It could help the procedure if the test is performed first with obstacle, and then without. System will activate any distance or time for keeping the robustness.

Performance requirements:

Chair have a question about the distance of target, especially the tolerance of distance, since the 00 series has a requirement for a range of 1.0 to 1.5 m distance of the target.
Industry reacted that the tolerance is short distance, and the variation of speed is satisfied.
Industry would like to keep the simple method.
UK provided the comment of tolerance. The industry confirmed that the tolerance is for a performance or the test procedure. Japan provided +0.2m of tolerance is enough in their experience.
The deep discussion is tomorrow.
Industry provided the maximum speed with tolerance is more important than the discussion of the distance of A.

ACPE-10-06 (Industry):

The detail of the proposal:

- Industry provided the discussion items in their document.
- They will exemption of N1 vehicle in scope
- Test procedure for the 00 series in Para. 6
- Initialization timing in Para 5.1.4
- Test procedure for the 01 series in Para. 6
- The lateral offset condition in Para. 5.1.5 d ii) and 6.5.2
- Pedestrian operation range in 5.1.5. d iii)
- Transitional provisions in Para. 12 (New for 2030, Existing for 2032)

5. Discussion for draft proposal (00 series) of ACPE regulation

Document: ACPE-10-07 (Industry)

ACPE-10-07 (Industry):

The proposal is to clarify paragraph 5.1.2.
Japan proposes to deal with this issue (definition of misapplication) in the test procedure.
Chair suggested that the requirements and the test procedure is different, and that this proposal focusses on the requirements (in section 5).
Japan questions whether the left diagram on slide 2 is not a pedal misapplication.

Industry explains that there could be a very long time between finishing the 70% of pedal travel with $\geq 400\%$ per second and then finally reaching the 90% pedal travel, and still, this would fall into the definition of pedal misapplication. They further outline that the pedal misapplication proposal is based on Korean accident EDR data.

Chair agreed with the industry explanation.
Korea is also agreed with the explanation of the industry.
Chair request that UK confirm the wording and language of the text.
UK agreed to work on the text.

Conclusion: Text proposal adopted as reflected in 10-02-rev-1

00 series text for 5.2.2. Long term deactivation:

The industry proposed (a), (b) or (c).
The floor agreed this proposal.
UK agreed to provide the wording on tomorrow.

Conclusion: Text adopted as shown in ACPE-10-02-rev1

Proposal for 5.2.3.1.3.1.

UK suggested that ACSF-A is for the parking manoeuvre.
Industry reacted the ACSF allows the override by the driver, and suggested that how to design the ACPE and the ADAS. They have a concern about the ACPE activation and the override issue.
Chair confirmed that if the driver controls the accelerator pedal in ACSF-A, and control strategies is unclear.
UK suggested that the misapplication can avoid this text.
The industry suggests that ACSF-A has a problem with interrupt of ACPE and ACSF.
Japan suggested that ACSF and ALKS can permit the driver control, so they would like to keep the original text.
Chair suggested that the mitigation of misapplication can work.
Germany provided that the ALKS and ACSF can deactivate, but ACPE should activate.
UK asked whether ADAS should be excluded per this paragraph.
Chair suggested that this issue will discuss on tomorrow.

Day 2

Japan can't support the industry proposal, they support UK proposal.
UK also can't support the industry proposal.

Conclusion: Proposal below adopted (see ACPE-10-02-rev 1)

5.2.3.1.3.1. While an Automated Driving System, ~~which allows a driver override,~~ is in control of the vehicle, ~~or an Advanced Driver Assistance System is in active mode (e.g. ALKS or ACSF category A is active),~~ the ACPE may be suspended or its control strategies adapted without indication to the driver, as long as ~~the risks of pedal misapplication remain mitigated to the same degree as provided by ACPE. it remains ensured that the vehicle provides at least the same acceleration suppression capabilities as the ACPE.~~ The suspension of the ACPE or the adapted control strategies shall be documented and demonstrated by the manufacturer to the Approval Authority during the inspection of the safety concept as part of the assessment to Annex 3.

6. Discussion for draft proposal (01 series) of ACPE regulation

Document: ACPE-10-02 (Chair and Secretary), ACPE-10-03 (Japan),
ACPE-10-08, 09, 10, 11, 12, 13, 14 (Industry)

Chair suggested that the first discussion should based on the presentations to identify positions, and then work on the text.

ACPE-10-08 (Industry):

The industry explains the proposal (footnote in scope, removing N1 from scope plus proposal for the introduction.

Chair recalls the discussion in the last meeting, where it was agreed to add text for the introduction and remove the brackets around N1 in the scope, or – if not agreed – ask GRVA for guidance on removal of the brackets..

UK: There will be problems if a CP wants to mandate ACPE for N1 vehicles yet N1 are not contained in the scope.

Chair suggested that the GRVA will decide this issue, please input the opinion about the footnote.

Japan can't support the footnote due to the confusion, UK, Germany and Korea support Japanese proposal.

Chair recall about the introduction.

Japan proposed the amendment, but Chair checked the other CP's opinion.

Conclusion:

Introduction text modified (as per ACPE-10-02-rev 1) and adopted.

Footnote not supported.

Guidance from GRVA on the removal of the brackets around N1 vehicles will be asked for in GRVA 20, including a summary of the positions of a) Industry and b) CPs.

ACPE-10-09 (Industry):

The industry proposed the exemption of a) N1 special purpose vehicles and b) .

The text proposal come from the other regulation.

Japan could understand, but confirm the both 1.4 and 1.5 or either 1.4 or 1.5

Conclusion: paragraph 1.4 from ACPE-10-09 is open issue to be discussed on the next day, 1.5 is agreed

ACPE-10-10 (Industry):

Japan provided the question about the time extension.

The industry answered to guarantee the requirements.

Japan accept this proposal, UK also accept this proposal.

Group agrees to remove the brackets around the value 6 s and adopts the proposal as shown below (also in ACPE-10-02-rev-1)

If ACPE is not ready to perform an intervention 6 s after the initiation of the vehicle powertrain, information of this status shall be indicated to the driver. This information shall exist until the system has been successfully initialised.

ACPE-10-03 (Japan):

Group agreed to Japanese proposal of 2.13 (definition of pedal misapplication, now without time or speed constraints)

Japan explained the paragraph 5.1.4.

Discussion about the interaction between AEBS and ACPE and the issue that on some markets, namely the European market, a fast and strong application of the accelerator pedal is used a means to overrule the AEBS system (e.g. in case of false intervention).

The industry suggested that the driver has a priority in any time. This is part of the safety concept of ADAS and AEBS.

Chair suggested that there are two phases, first is that a driver would like to interrupt the AEBS, second is that how to deal with the ACPE (e.g. consider a pedal application comparable to the pedal misapplication as an overruling of the AEBS, but not as a wish for a strong acceleration)

The industry explains that if the vehicle detects the clear intention of a driver (e.g. a the pedal application as mentioned above), the vehicle will stop the ACPE and follow the wish of the driver which in this case would be to accelerate).

Japan elaborated on this idea and asked whether it is possible to distinguish the interrupt manoeuvre of the AEBS and the misapplication manoeuvre.

They pointed out that their data show this phenomenon, the misapplication and the interruption can be distinguished.

The industry shows a scenario on the white board where a vehicle would need to accelerate in an intersection to escape oncoming traffic despite an AEBS false reaction occurs. A two-step overruling of the AEBS would require too much time in this case, and therefore the Japanese proposal should be considered to be a design limitation with regard to the design of the AEBS.

Japan pointed out that there is no evidence of accidents in this situation in Japan where a relevant number of vehicles is already equipped with ACPE.

Chair suggested the speed at which the overruling of AEBS / the pedal misapplication occurs is important.

DE: Japan made a good suggestion. In the scenario as described by industry, there needs to be a) a false positive AEBS intervention, b) an overlap of the speed, c) system available.

Ind: Both systems are active at all times.

The industry proposed a new paragraph.

The ACPE shall control acceleration when the vehicle is accelerated both from standstill. and while creeping [off] **as relevant.**

An ACPE intervention is only required if the creeping speed (if applicable) of the vehicle is below the minimum activation speed of a fitted AEBS.

The manufacturer shall demonstrate the minimum activation speed of the AEBS to the satisfaction of the Technical Service.

The creeping speed with which the vehicle is to be tested to demonstrate compliance to this requirements shall be [0.5] km/h lower than the minimum AEBS activation speed.

Japan pointed out that if AEBS is active down to 1 km/h, then the ACPE will be meaningless.

Industry answered that in that case then remains for standstill.

Japan suggested that still cannot support that.

Industry responded that AEBS has a higher potential than ACPE.

Japan should have coexistence.

Industry explained there is no time for overriding the AEBS anyway for low speeds..

The industry explains with ACPE-09-08 about the relationship between AEBS and ACPE.

Japan confirms the problem of the industry idea (real world or test procedure)

The industry explains about the problem, the problem is the override of AEBS.

The industry explains that when the AEBS activates, but a driver controls the pedal, the vehicle should stop the AEBS activation and also stop the ACPE activation. Driving priority has a driver. This is fundamental.

Japan suggested that a driver sometimes makes a mistake, that is why we discuss the ACPE system.

The industry explains it is difficult to distinguish between the intentional pedal action and pedal misapplication.

Chair points out that there can be a separation between ACPE and AEBS either by speeds (low speeds ACPE, higher speeds AEBS) or by the sequence (e.g. after AEBS activation ACPE is suspended)

Group discusses and then settles on the separation by sequence. Paragraph below adopted (also shown in ACPE-10-02-rev-1)

- 5.1.4. The ACPE shall control acceleration when the vehicle is accelerated **both** from standstill, **and while creeping** ~~{off}~~.
- ~~{An ACPE intervention shall is not required when there is an AEB warning or intervention occurring. as defined in Regulation (UN) No. 152 in any series of amendments}~~
- The ACPE shall be ready to perform an intervention no later than 6 seconds following the initiation of the vehicle powertrain.**

ACPE-10-12 (Industry):

The industry provide the proposal of Lateral offset text amendment (Vehicle, Wall)

ACPE-10-16 (UK):

UK propose the operational range.

The industry request the justification of UK proposal, as the proposal goes beyond the consensus that was reached in the last meeting (i.e. higher performance requirements).

Japan support the proposal of the industry.

UK explain the intention of their proposal: they aim to make technical requirements for pedestrian, vehicle and wall more consistent by requiring a comparable overlap between vehicle and target..

The industry request the justification of UK proposal based on the traffic accident data.

Chair confirmed the position of CP

UK would like to keep their proposal.

If the vehicle detects the pedestrian, the vehicle also can detect the vehicle.

ACPE-10-13 (Industry) presented, which looks at the same topic:

Their proposal of the position of the pedestrian is based on the Euro NCAP test protocols (by placing the pedestrian dummy between the 25% and 75% position of the width of the vehicle)..

Japan calculated both proposals, but they can't understand the difference of proposals.

Discussion on the white board to identify the difference between UK and Industry proposal.

Group agrees to the spirit of the Industry proposal with regard to the placement of the pedestrian dummy. The following paragraphs adopted:

(ii) In the case of a vehicle ~~or wall~~ obstacle, The lateral offset between the centreline of the obstacle and the centreline of the vehicle is not more than 0.2 m the centre line of the obstacle is located between two vertical longitudinal planes defining the extreme outer edge of the vehicle.

(iii) In the case of a wall obstacle, the overlap between wall and vehicle is at least 1.0 m.

(iv) In the case of a pedestrian obstacle, the distance between the centre line of the pedestrian obstacle and the centre line of the vehicle is not more than 25% of the vehicle width ~~obstentire pedestrian obstacle is located between two vertical longitudinal planes which are 0.1m within the extreme outer edge of the vehicle.~~

10-03 reopened, definition of creeping.

Proposal Industry: "Creeping speed"

CLEPA: Should we speak about engine temp and flat surface?

Text proposed and adopted. Parked for later improvement, but good enough for now.

Closed.

ACPE-10-11(Industry) about removing the stationary test procedure from the 01 series of amendments of the regulation.

Japan would like to keep the requirement of stationary, but the test procedure is flexible.

Japan would like to keep two test procedures, and if TS request the stationary test, test will carry out.

Korea support Japanese idea.

Japan, Korea support only to require the creeping test.

Conclusion: Default is to test the creeping procedure. Stationary test procedure referenced in paragraph 6.7:

- 6.6⁸⁷. If this is deemed justified, the Technical Service may test in any test condition within the conditions specified in paragraph 5.1. during the tests as described in paragraph 6.5., e.g. testing a creeping vehicle also according to section 6.6.1.

Industry proposes a simplification of the test procedure, however since this is quite a fundamental change, chair requests the group to consider this test procedure until the next session of the IWG (put brackets around the test procedure).

Discussion about the distance of the target in paragraph 5.1.5 as Industry pointed out that 1 m distance is very close.

JP: Keep 5.1.5. like it is, but focus on 1.5 m in 5.1.6. only.

Conclusion:

Test procedure and target distance in brackets, to be reviewed for the next meeting XXX to be done in ACPE-10-02-rev-1 XXX

Long term deactivation of 00 series

UK proposed the text, group adopted the text and industry is tasked to provide the justification.

This should then also be reflected in the 01 series of the regulation.

10-09, 1.4 reopened. Note that it is just about the rear sensors. Japan would accept 1.4 proposal by Industry, Korea as well. UK might have some issues, as well as the text needs work.

Also Industry keen on removing N1 (so, also M1 vehicles) from 1.5.

Homework for Industry: bring examples.

Discussion of Transitional provisions

Proposal: 30/32, because 00 series will enter into the market from 28 onwards, market confusion.

Japan: Two years after, so Sept 2029/2031

UK: Flexible, but why justification = market confusion?

Industry: Pedestrian technology is a challenge as well.

Korea: Flexible, 2030 sounds a bit + should be discusses in the light of the test procedure.

Germany would like to keep this issue until the next IWG. They will check with EC about plans for application in EU.

Item to be discussed in the next meeting.

7. Confirmation for gtr activities of ACPE regulation based on the 193rd session of WP.29

Document: WP.29-1179 (Reports of the 193rd session of WP.29 in page 32)

Japan explain about the situation of GTR activity.

Japan

8. Planning of 20th GRVA

We request the guidance about N1.

00 series and report

Confirm the deadline of working document.

9. Other business

10. List of action items and next meetings

11th ACPE IWG:

Date: 28 - 29 October in Web

Time: 9:00 CET – 12:00 CET

List of homework / open items for the next meeting

Transitional Provisions (minor change, long discussion → Oct 28?)

Industry to bring examples supporting paragraph 1.4 (incomplete vehicles)

Target distance [1.0 to 1.5 m]

Test Procedure, provide comments to the test procedure overhaul by Industry (→ include in 10-02-rev-1)

(→ large change, better to discuss this October 21)