# Summary of VRU-Proxi IWG Reversing Motion Task Force

# Discussions

2019.11.26

Chair: Akinari HIRAO, Ph.D., CPE.
JAPAN

# Attendee

**#1 191024**

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Akinari Hirao (Japan)

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Benoit Moreau (PSA)
Norimitsu Hayashi (Isuzu)
Lisa Schaber (VW)
Meurer Dieter (B
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Jürss Katja (Volvo)

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Gerald Eckert (VW)
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M. Oda (Denso Europe)

Felix Kriedemann

**Around 20 attendee for every TF web meeting.**
**Thank you for cooperation !!**

# Key discussion points

Extracted from GRSG-117-34
and added some issues

| No. | Discussion points | What / who? |
|---|---|---|
| 1 | Exemption from the scope | To be proposed by OICA |
| 2 | System response time after start (Rear-View Camera system latency) | To be proposed by OICA |
| 3 | Overlays, Screen change | To be proposed by OICA |
| 4 | Deactivation of RVC<br><br>* Driver's modified view include switched-off or not. | To be proposed by OICA<br><br>EC (Waiting for NHTSA answer.) |
| 5 | Direct view by turning around of the driver and including vehicle with or without (additional) Close-proximity rear view mirror. | To be proposed by OICA |
| 6 | Image quality or object size of RVC | To be proposed by OICA |
| 7 | Impact Test and radius conditions of devices<br><br>* IWG consensus is impact test is not needed.<br>But France has concern. ([ ] in draft.) | Gather CP's opinion |
| 8 | Test procedure (Not reviewed in IWG after Chap.17) | All |

# #1 Exemption from the scope

1.4. The following vehicles of category M and N shall be exempted from this Regulation:

-Vehicles where installation of any device for reversing safety is incompatible with their on-road use may be partly or fully exempted from this Regulation, subject to the decision of the Type Approval Authority.

[- Tractor unit can be exempted if reversing alarm equipped.]

[- Vehicles intended to be used with a semi-trailer shall be exempted from this Regulation. ]

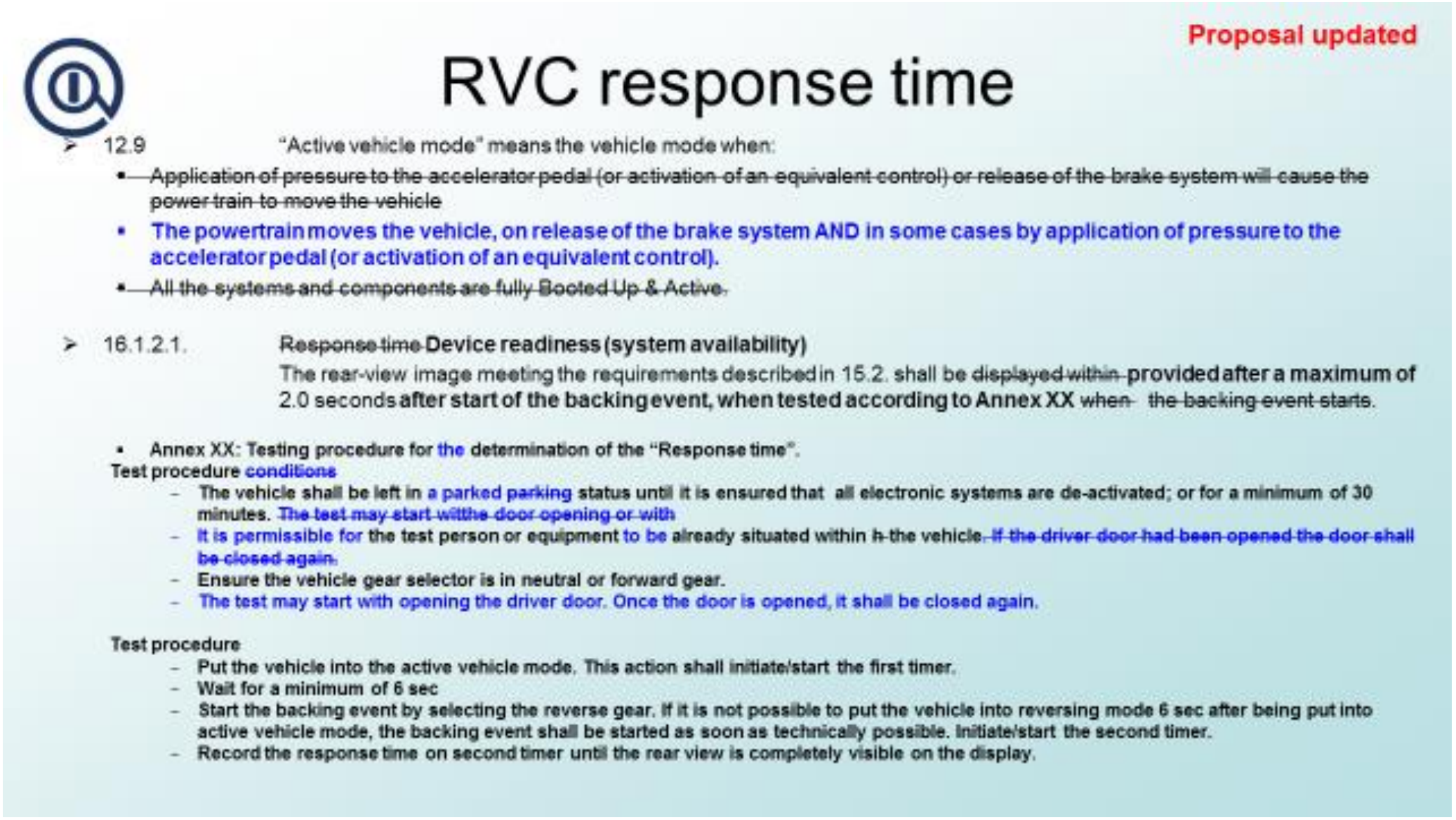
* Updated using R73 description

Not discussed in TF
due to no proposal.

**Open.**

# #2 System response time after start (Rear-View Camera system latency)

OICA proposal.



Proposal updated

## RVC response time

➢ 12.9 "Active vehicle mode" means the vehicle mode when:

- ~~Application of pressure to the accelerator pedal (or activation of an equivalent control) or release of the brake system will cause the power train to move the vehicle~~
- The powertrain moves the vehicle, on release of the brake system AND in some cases by application of pressure to the accelerator pedal (or activation of an equivalent control).
- ~~All the systems and components are fully Booted Up & Active.~~

➢ 16.1.2.1. ~~Response time~~ Device readiness (system availability)

The rear-view image meeting the requirements described in 15.2. shall be ~~displayed within~~ provided after a maximum of 2.0 seconds after start of the backing event, when tested according to Annex XX ~~when the backing event starts.~~

- Annex XX: Testing procedure for the determination of the "Response time".

Test procedure conditions

- The vehicle shall be left in a parked parking status until it is ensured that all electronic systems are de-activated; or for a minimum of 30 minutes. ~~The test may start withthe door opening or with~~
- It is permissible for the test person or equipment to be already situated within h the vehicle. ~~If the driver door had been opened the door shall be closed again.~~
- Ensure the vehicle gear selector is in neutral or forward gear.
- The test may start with opening the driver door. Once the door is opened, it shall be closed again.

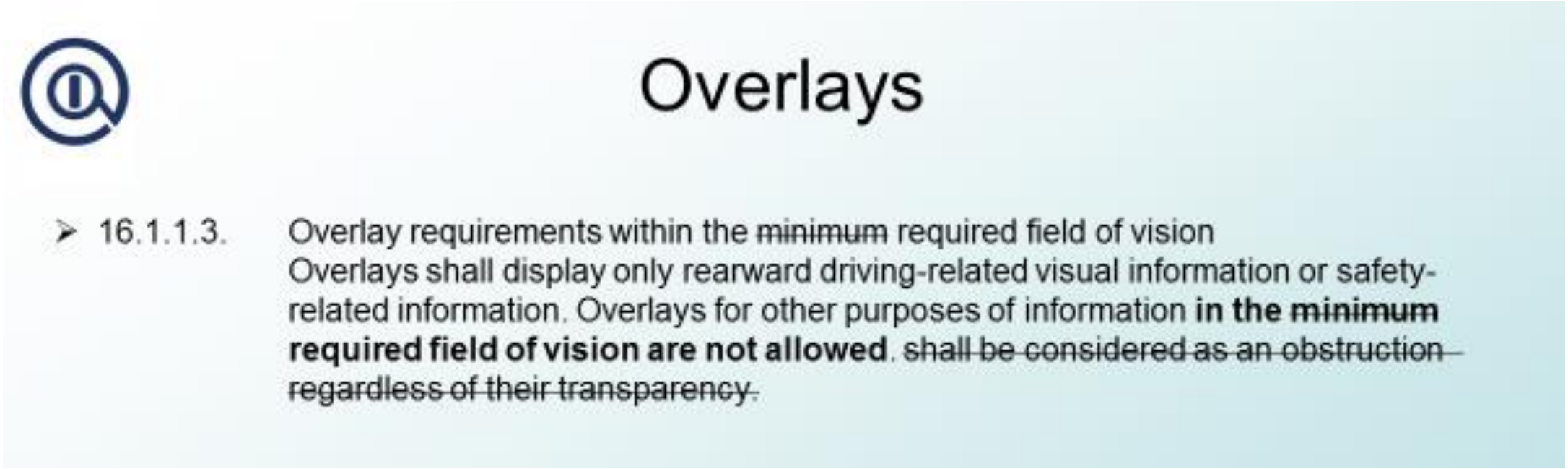
Test procedure

- Put the vehicle into the active vehicle mode. This action shall initiate/start the first timer.
- Wait for a minimum of 6 sec
- Start the backing event by selecting the reverse gear. If it is not possible to put the vehicle into reversing mode 6 sec after being put into active vehicle mode, the backing event shall be started as soon as technically possible. Initiate/start the second timer.
- Record the response time on second timer until the rear view is completely visible on the display.

**Agreed with attendee.**

# #3 Overlays, Screen change

OICA proposal.




**Agreed with attendee.**

# #4 Deactivation

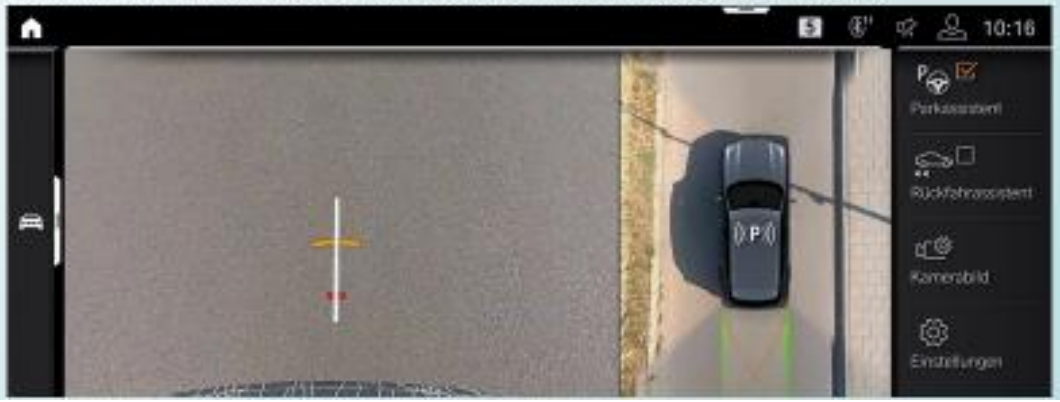
OICA proposal

## Deactivation

- 16.1.1.4. Deactivation **of the required field of vision**

  The rear-view image shall remain visible during the backing event until either, the driver modifies the view, or the vehicle direction selector is removed from the reverse position.

- A manual change of view is allowed: for instance, a trailer hitch view (see VRU-Proxi-10-11 (OICA) 190425_Arguments_Overlays - CoV.pdf)
- A complete deactivation is under discussion
- Trailer hitch view example (already shared – see VRU-Proxi-10-11)
  - If driver wants to couple vehicle with a trailer BMW offers the trailer hitch view.
  - **Trailer hitch view** show driver in which direction he has to steer in order to couple with the trailer




Information update:
EC confirmed NHTSA definition.

Allow all driver's modifications include image quality adjustments, other screens (include all black) and views.

1) Deactivation or switching off, change other purpose screen (erase rear view)
2) Change rear camera view to selected camera view for safe reversing such as front view etc.

**Agreed with attendee.**

# #5 Direct view by turning around of the driver and including vehicle with or without (additional) Close-proximity rear view mirror.

OICA proposal.

## Close Proximity Rear-View Field of Vision

➢ New requirement to be added

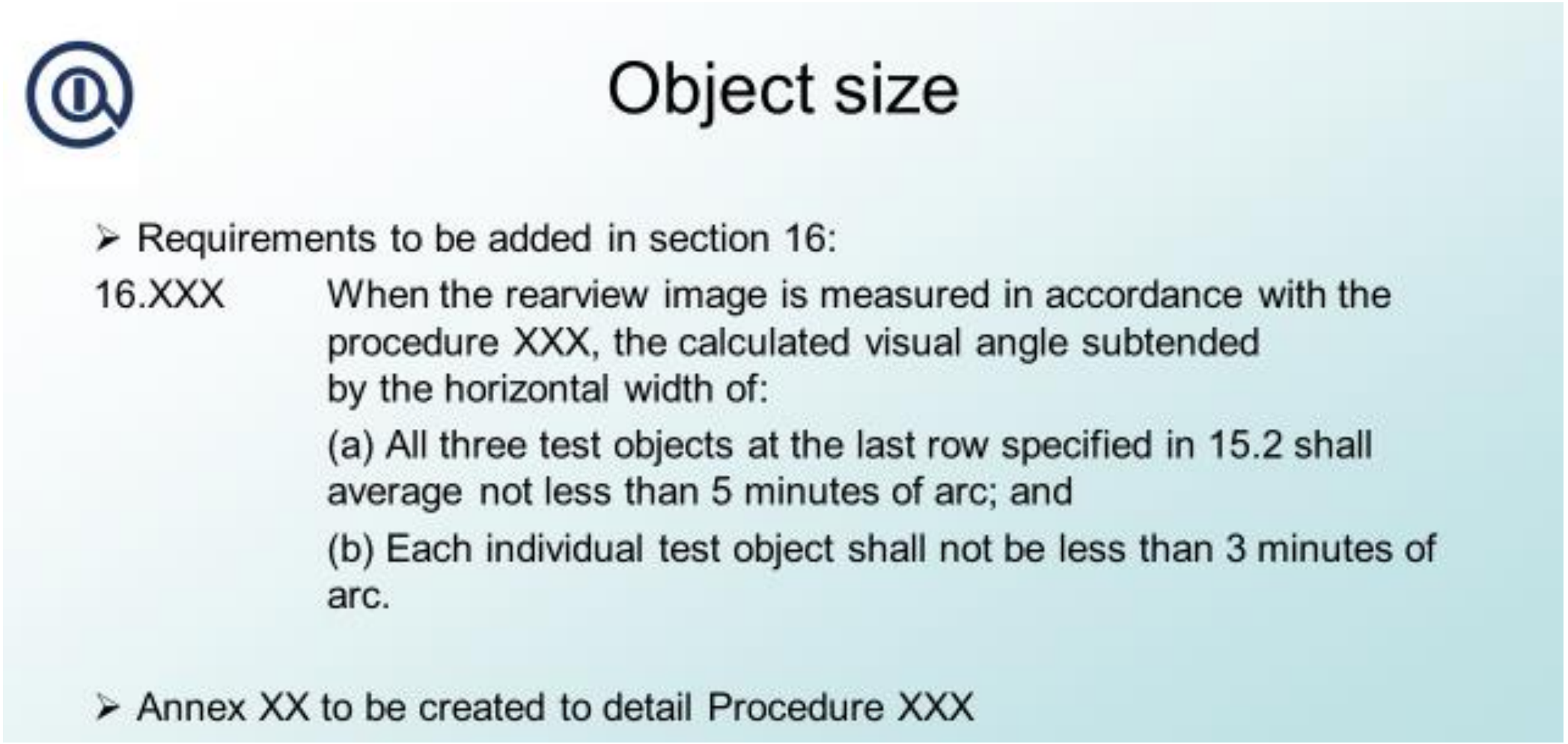
| | |
|---|---|
| 15.2.1 | When tested under the conditions defined in Annex 9 the requirement for close-proximity rear-view field of vision shall be considered to be satisfied if the defined field of vision can be seen: |
| 15.2.1.1 | via the direct view from the driver's looking back ocular points; or |
| 15.2.1.2 | via the direct view from the driver's looking back ocular points combined with a close-proximity rear-view mirror installed at the rear end of the vehicle supporting this direct view; or |
| … | |
| **15.2.1.6** | **The options 15.2.1.1 and 15.2.1.2 only apply to the vehicle categories M1 and N1.** |

**CLEPA (Brigate) comment: How to handle about driver's usage? Driver can use rear mirror with inside-mirror (periscope). Object size on the mirror shall be defined.**
**OICA comment:**
**Important to keep normal driver behavior (looking back and check surroundings).**

**Open.**

# #6 Image quality or object size

OICA proposal.




**Agreed with attendee.**

# #7 Impact Test and radius requirements of devices

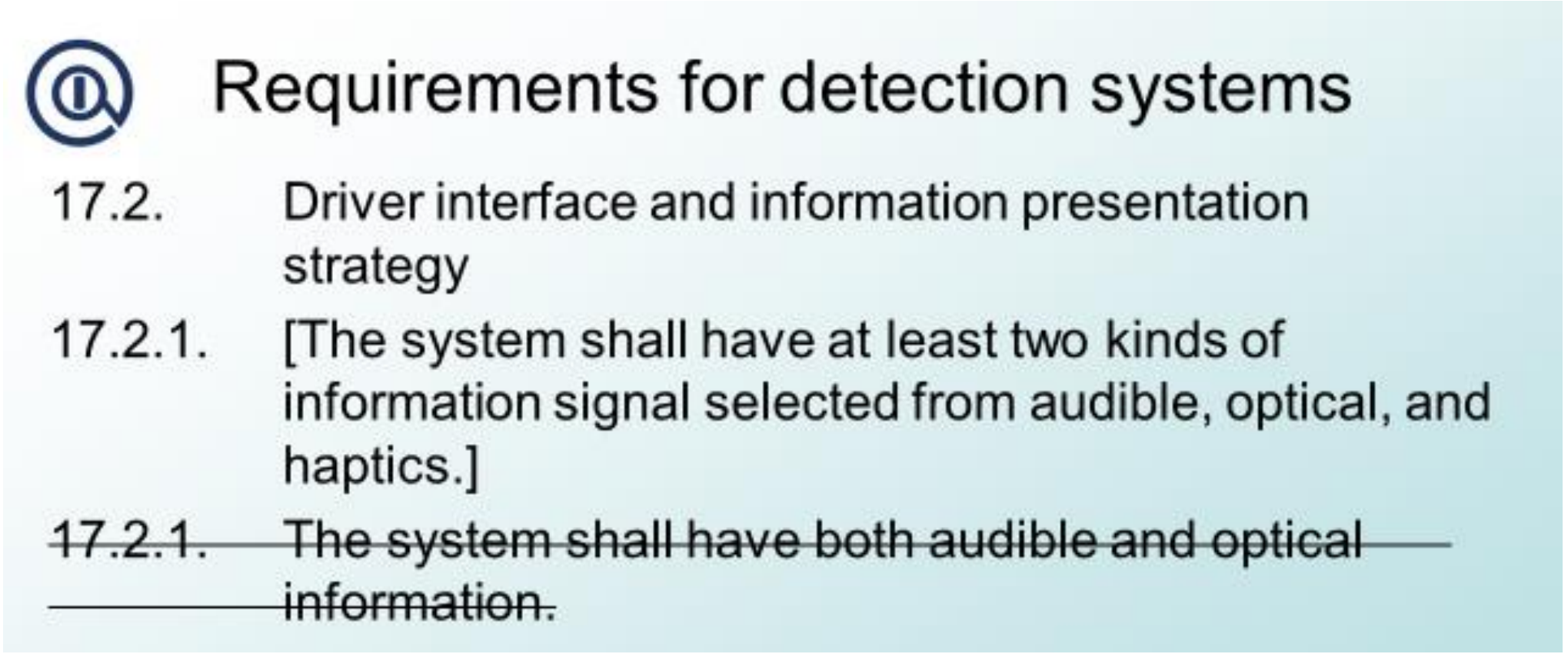
Gather CPs' opinion for the needs of the Impact test.
How to secure requirements for safe impact such as radius etc?

**Canada: Need FMVSS requirements.**
**CLEPA (Brigate): 6.3.2 to be kept even if 6.3 removed.**

**Open.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.



Requirements for detection systems

17.2. Driver interface and information presentation strategy

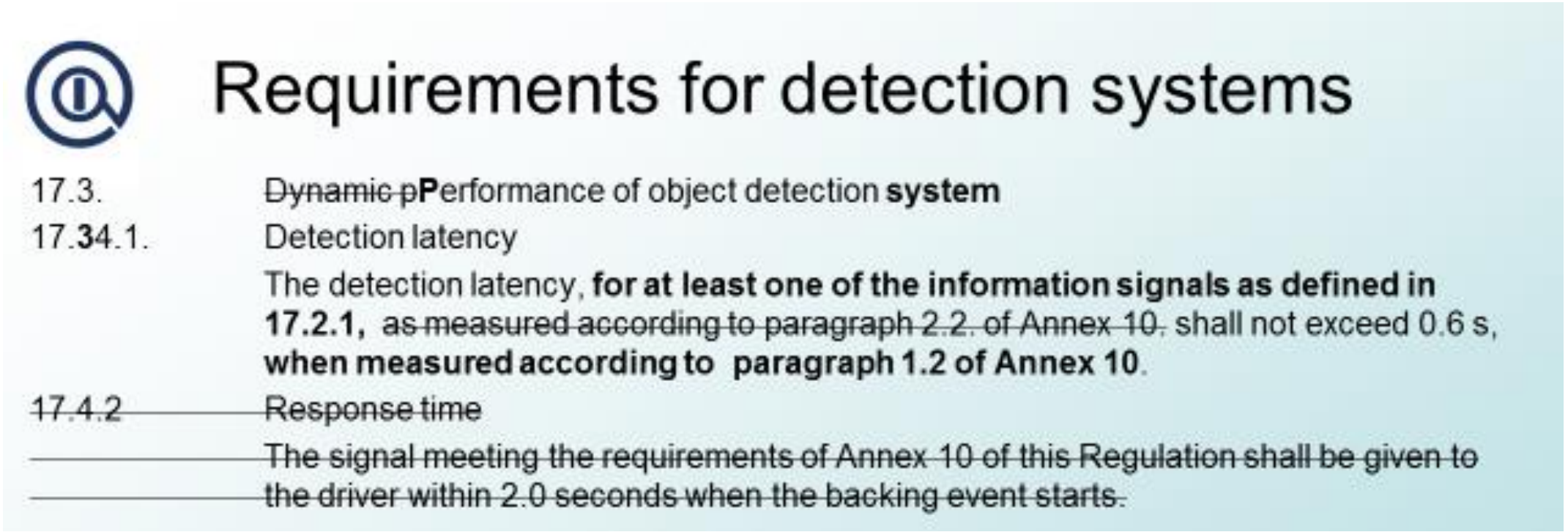
17.2.1. [The system shall have at least two kinds of information signal selected from audible, optical, and haptics.]

~~17.2.1. The system shall have both audible and optical information.~~

**Agreed with attendee.**
**Japan agreed it was removal miss.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.



## Requirements for detection systems

17.3. ~~Dynamic p~~**P**erformance of object detection **system**

17.**3**4.1. Detection latency

The detection latency, **for at least one of the information signals as defined in 17.2.1,** ~~as measured according to paragraph 2.2. of Annex 10.~~ shall not exceed 0.6 s, **when measured according to paragraph 1.2 of Annex 10**.

~~17.4.2 Response time~~

~~The signal meeting the requirements of Annex 10 of this Regulation shall be given to the driver within 2.0 seconds when the backing event starts.~~

**Agreed with attendee.**
**Japan agreed.**
**Regarding detection system, it is enough for requirement about detection latency.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.

## Test Methods for Detection Systems

- 1.2. Test ~~conditions~~ **preparation**
- ~~The testing environment and test object shall be as per paragraph 23. of this annex.~~ One test object shall be used. The distance from the rear edge to the test object and the position of the test object are selected by the manufacturer to ensure the detection of the test object. The test object shall be located in the detectable grids within the rear horizontal area in paragraph 25. of this annex. The test vehicle in the initial state shall be with the detection system in the activated state, which is declared [by the manufacturer OR in the owner's manual] and shall be in the parking condition. Here, the parking condition means that the P (park) position is selected in the case of vehicles equipped with automatic transmissions, whereas it means the neutral gear being selected and the parking brake being engaged in the case of vehicles equipped with manual transmissions.

**Agreed with attendee.**
**Japan agreed it was removal miss.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.

New Proposal

## Close Proximity Rear-View Field of Vision requirement

- § 1.3 from Annex 9 to be moved to 15.2

Annex 9

1.3. Requirements

(a) for the test objects in the first row (Test objects A, B, and C):

A 0.15 m x 0.15 m area or the top of the test object shall be visible at at least one position on each test object.

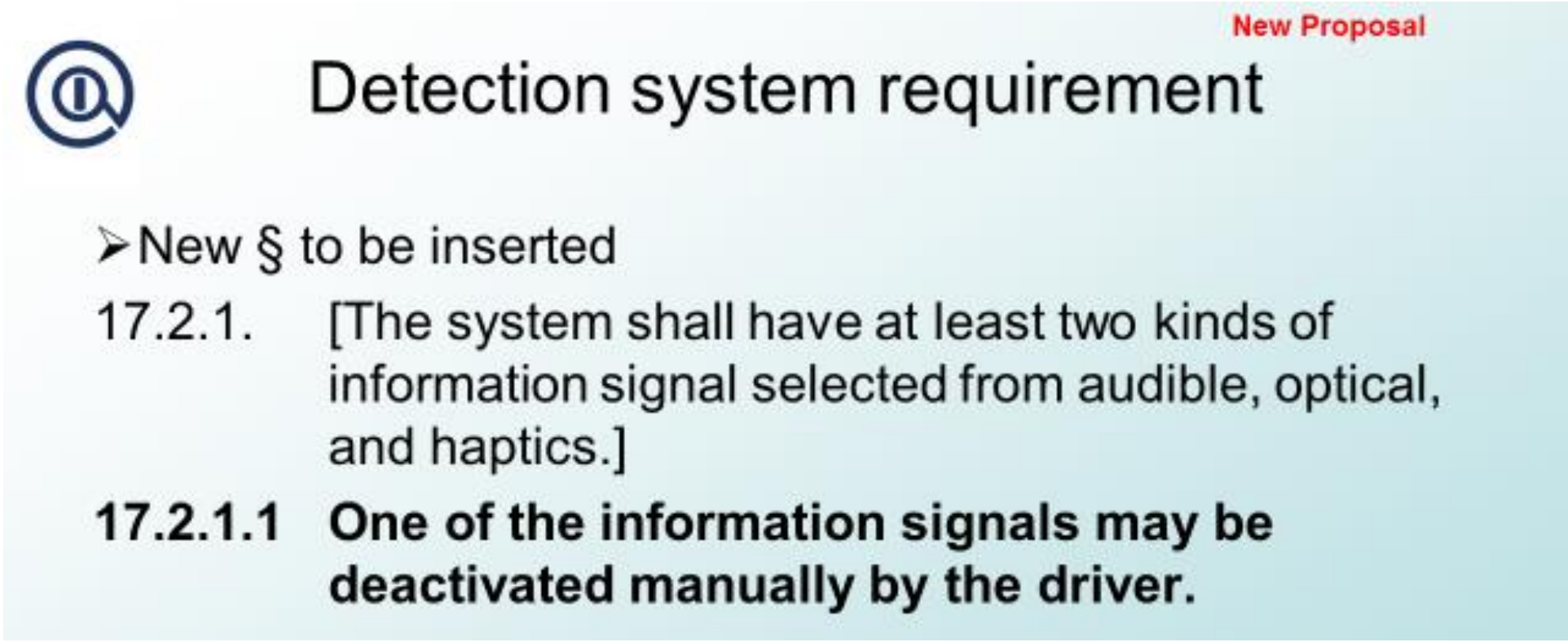
(b) for the test objects in the second row (Test objects D, E, and F) and the third row (Test objects G, H, and I);

The whole ~~height of the~~ test object shall be seen.

**Agreed with attendee.**
**Japan agreed it is common understanding.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.

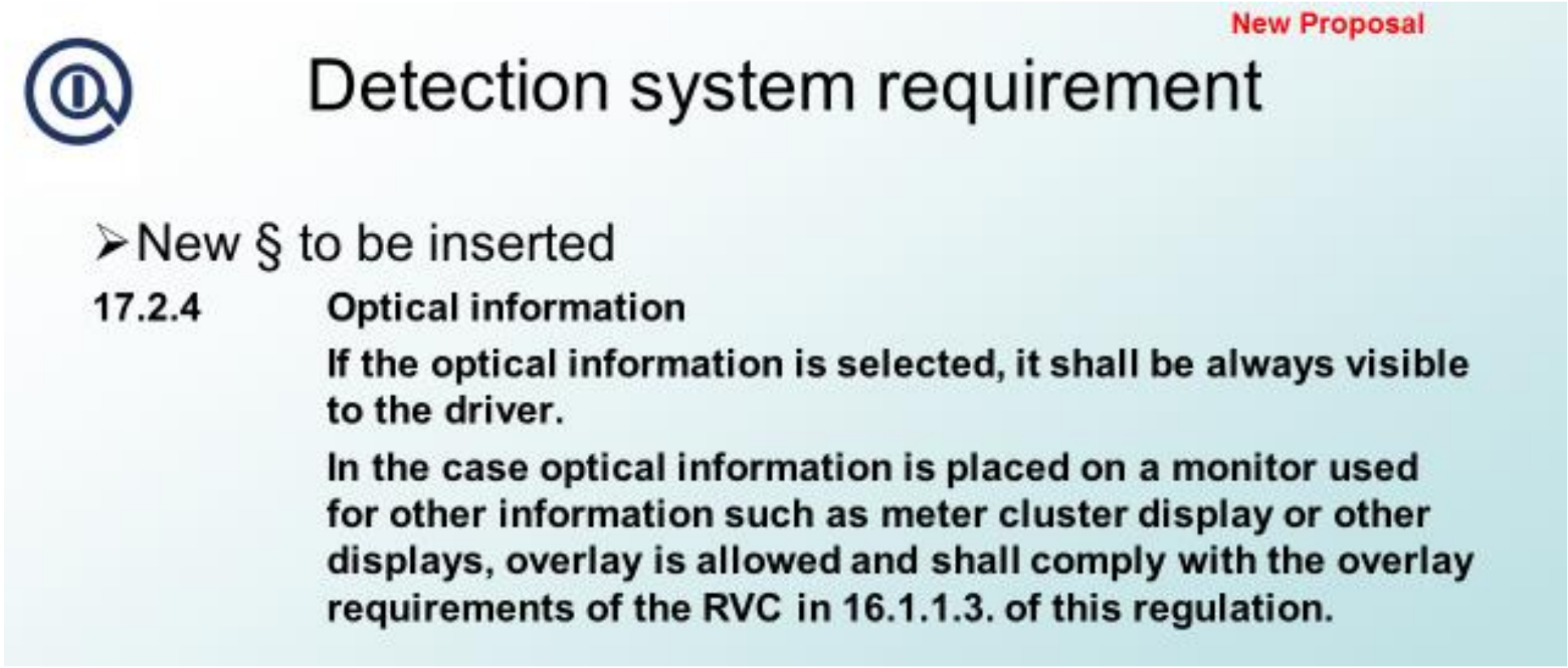



**Agreed with attendee.**

**Japan comment: [ ] of 17.2.1. can be removed for past agreement.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.




**Agreed with attendee.**

**Japan agreed.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

OICA proposal.

New Proposal

## Annex 9

### ➢ 1.2. Test object locations and orientations

Place the test objects at the locations specified in (a) to (h) and illustrated in Figure B. Measure the distances shown in Figure B from a test object to another test object or other object from the cylindrical centre (axis) of the test object as viewed from above. Each test object shall be oriented so that its axis is vertical.

(a) Place test objects A, B, and C so that their centres are in a transverse vertical plane that is 0.3 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.

(b) Place test object B so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

(c) Place test objects D, E, and F so that their centres are in a transverse vertical plane that is 1.5 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.

(d) Place test object E so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

(e) Place test objects G, H, and I so that their centres are in a transverse vertical plane that is 3.5 m to the rear of a transverse vertical plane tangential to the rearmost surface of the rear bumper.

(f) Place test object H so that its centre is in a longitudinal vertical plane passing through the vehicle's longitudinal centreline.

(g) Place test objects A, D, and G so that their outermosts are in a longitudinal vertical plane tangential to the left-side outermost surface of the vehicle.

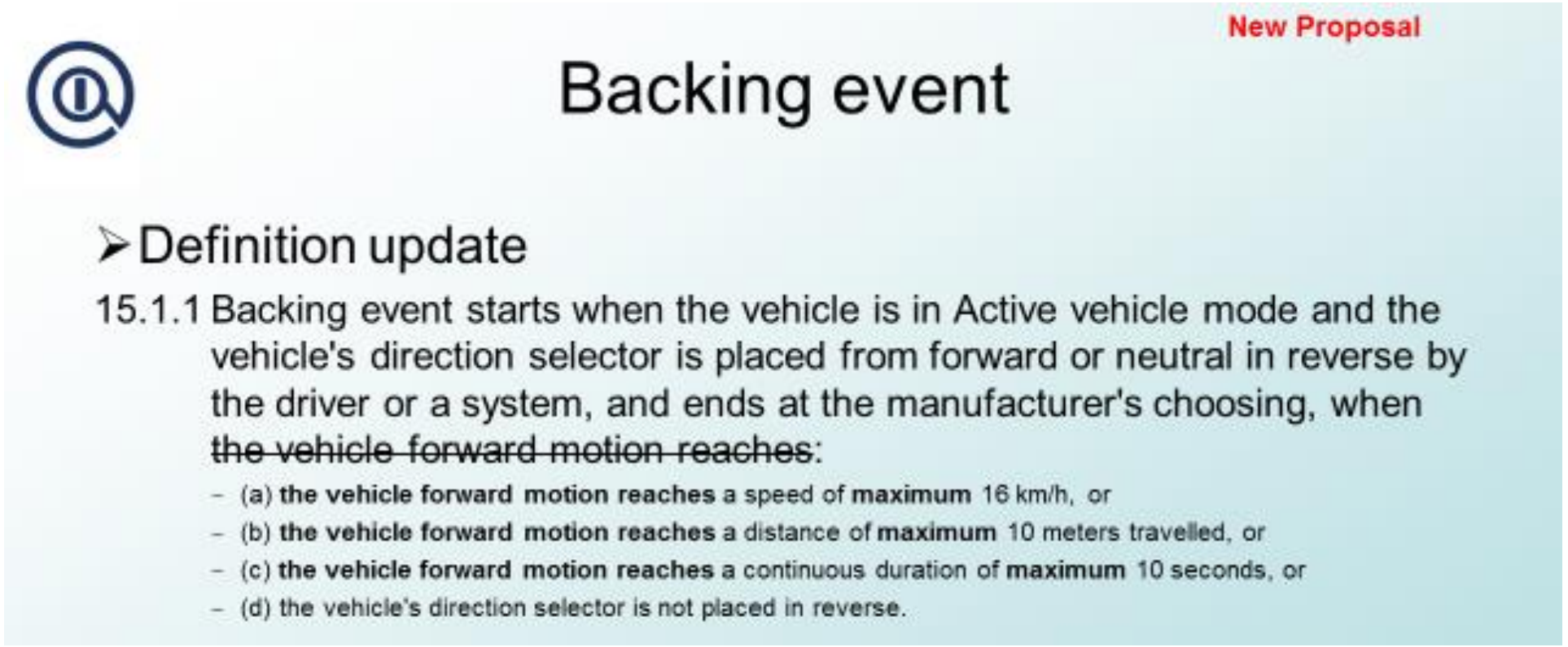
(h) Place test objects C, F, and I so that their outermosts are in a longitudinal vertical plane tangential to the right-side outermost surface of the vehicle.

~~Test object locations can be added between A to I by the Technical Service.~~

**Agreed with attendee.**
**Japan agreed it was removal miss.**

# # New proposal

OICA proposal.




**Agreed with attendee.**

**Japan comment: Is it ok for not the same requirements as FMVSS111?**

# # New proposal

OICA proposal.


**OICA raised new subject for discussion about aftersales user modification. It conflicts camera or detection system.**

**Japan comment: To be discussed with CPs in IWG.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

CLEPA proposal

## CONCERN POINTS ON DETECTION SYSTEM

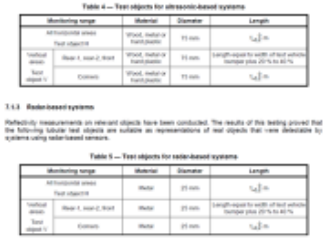
1.) Reference ISO Standard (ISO 17386:2010) is mainly designed for PC => does not address CV applications

Reversing aids and obstacle-detection devices on heavy commercial vehicles are not addressed by this International Standard; requirements for those systems are defined in ISO/TR 12155.

2.) Reference ISO Standard (ISO 17386:2010) has the focus on USS solution

MALSO systems use object-detection devices (sensors) for ranging in order to provide the driver with information based on the distance to obstacles. The sensing technology is not addressed; however, technology affects the performance-test procedures set up in this International Standard (see Clause 7). The current test objects are defined based on systems using ultrasonic sensors, which reflect the most commonly used technology at the time of publishing this International Standard. For other sensing technologies possibly coming up in the future, these test objects shall be checked and changed if required.

3.) Test object with no link to VRU (Vulnerable Road Users)



Poles

(3) Over the past decades, developments in vehicle safety have contributed significantly to the overall reduction in the number of road fatalities and severe injuries. However, *25 300 people died on Union roads in 2017, a figure that has remained constant in the last four years. Moreover, 135 000 people are seriously injured in collisions every year . The Union should do its utmost to reduce or to eliminate accidents and injuries in road transport. In addition to safety measures to protect vehicle occupants, the implementation of specific measures to prevent fatalities and injuries of vulnerable road users, such as cyclists and pedestrians, is needed to protect road users outside of the vehicle.* Without new initiatives on general road

GSR with focus VRU!

According test object is considered in
a.) BSIS (Blind Spot Information System)

Most probably will be considered in
b.) MOIS (Moving Off Information System)

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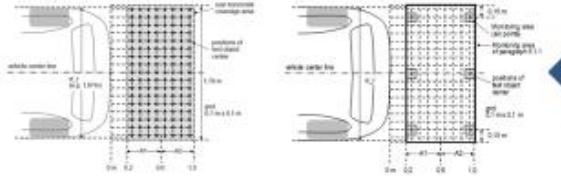
## CONCERN POINTS ON DETECTION SYSTEM

4.) Detection range (ISO 17386:2010) => focus on existing PC applications using USS



Source: internet

Test fits for M1, but does not really fit for larger categories (e.g. to N2 and N3 applications)

5.) No consideration of crossing scenario

VRU-Proxi-11-15 Draft minutes

- It was remarked that accident statistics indicates that moving pedestrian (crossing at the rear) ought to be addressed as Reversing Motion scenario. Chair took notice and proposed after consideration to move this to a second phase in order to avoid jeopardizing the deadline for submission of the draft regulation (April 2020). UK, J, F and the Industry agreed.

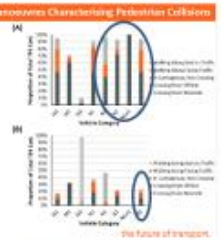
Reference: VRU-Proxi-11-08

**Key Collision Characteristics: REV**

TRL

Key Vehicle and VRU Manoeuvres Characterising Pedestrian Collisions

- Comparison of pedestrian manoeuvres for:
  - A. Reversing – driver failed to look properly
  - B. Reversing – vehicle blind spot
  - C. Reversing – both contributory factors
  - D. Reversing – either contributory factor
- Key pedestrian manoeuvres:
  - Crossing from nearside/offside
  - In carriageway – relatively small proportion
- Vehicle categories:
  - M3 vehicle collisions primarily associated with vehicle blind spots – CMS needed?
  - Other vehicles dominated by driver failing to look properly – information systems needed?



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Material: VRU-12-02

**CLEPA raised 5 discussion points for detection system.**

1) **Current system based on passenger vehicle ISO.**
2) **ISO based on sonar.**
3) **Test object is not VRU.**
4) **Detection range not suitable for commercial vehicles.**
5) **No consideration for crossing scenario.**

# #8 Test procedure (Not reviewed in IWG after Chap.17)

CLEPA proposal.

CLEPA raised 5 discussion points for detection system.

1) Current system based on passenger vehicle ISO.
2) ISO based on sonar.
3) Test object is not VRU.
4) Detection range not suitable for commercial vehicles.
5) No consideration for crossing scenario.

**Discussed comments.**

**1), 2),4)**

- **Just a little bit late proposal. If proposal was earlier, we can consider these things.**
- **Proposed 2m detection brings more false warnings.**
- **Current detection system requirements based on camera compatibility secured ISO fitted sonar. If new requirements to be proposed, need to indicate compatibility with current requirements.**

**3)**

- **Dummy test results is not stable for detection.**

**5)**

- **This regulation is based on provision of indirect vision. Camera does not detect anything.**
- **Crossing scenario is another aspects to be discussed on second phase.**

# # Modification of draft proposal from CLEPA (Brigate)

CLEPA proposal.

- “Rear View Camera” -> “Rear View Camera **Monitoring System**”
  Original purpose was word differentiation between RVC and CMS from OICA.

- “Monitoring area” -> “Field of detection”
  OICA proposal part.
  But I can be accepted.

- Part of impact test seems to be remained.
  To be discussed in IWG (Topic #7)

- Back sunlight requirement to be come back.
  OICA proposed deletion and no objection in last IWG.

- “Backing event” -> “Reversing motion event”
  OICA proposed harmonization of the word with FMVSS111.

Thank you for cooperation about making reversing regulation.