DRAFT REPORT

4th meeting of GRRF Informal Working Group on Automatically Commanded Steering Function

Venue: Venue: Jasic Office Tokyo, Japan.
Chairman: Mr. Christian Theis (D) and Mr. Hidenobu Kubota (J)
Secretariat: Mr. Jochen Schaefer (CLEPA)
Dates: 25.-27. November 2015
Website: https://www2.unece.org/wiki/display/trans/ACSF+4th+session

1. Participants:

see special attachment

2. Welcome and Introduction

3. Approval of the report of the 3rd Session

The report of the 3rd Session was approved by the delegates
ACACSF-03-17-Rev2 (Secretary) Adopted Report of 3rd session

4. Approval of the agenda

The agenda was adopted and confirmed by the delegates without amendments.
ACSF-04-02-Rev1 (Secretary) Agenda 4th session

5. List of Documents:

Documents:
ACSF-04-03 (F) Proposal for amendments in R79 based on ACSF-03-16
ACSF-04-04 (D) Protective Braking for ACSF
ACSF-04-05 (D) Safe Distance Requirements for ACSF
ACSF-04-06 (D) Lane Change Test for ACSF
ACSF-04-07 (D) Minimal Risk Manoeuvre
ACSF-04-08 (J) Definition of Category E
ACSF-04-09 (KR) Proposal based on ACSF-03-16
ACSF-04-10 (J) Comments based on ACSF-03-16
ACSF-04-11 (NL) Homework of 3rd meeting
ACSF-04-12 (OICA-CLEPA) Industry input - concept of Transition Demand (TD) and Minimal Risk Manoeuvre (MRM)

ACSF-04-12-Rev1 (OICA-CLEPA) Industry input - concept of Transition Demand (TD) and Minimal Risk Manoeuvre (MRM)
ACSF-04-13 (OICA-CLEPA) Comments based on ACSF-03-16
ACSF-04-14 (J) Survey Transition Time
ACSF-04-15 (J) Results of the Study
ACSF-04-16 (J) Proposal for Transition time
ACSF-04-17 (D) Proposal based on ACSF-03-16
ACSF-04-18 (Secretary) Warning-Time for CAT E Systems - Result out of the meeting
ACSF-04-20 (Secretary) Consolidated Document after 4th session

6. Special Discussion

6.1. Automated Driving System in the Tesla vehicle

Contracting Parties (CP) and industry showed their surprise about the fact, that the Tesla Model S was homologated with a steering system, which does also contain an auto lane change function, for which the ACSF informal working group is currently defining requirements.

(D) and (SE) are checking the background, how the homologation (by E4) can be justified.
(CLEPA): Board members of different companies are really confused, why we are doing the work in the IWG ACSF, if a homologation of such a system is possible without any amendment of the current regulations.
(EC): expects to get more clarity about this issue
(J): Question: is this system a ACSF-System or not?
(D): Nevertheless a continue of the work in the ACSF group is necessary.

This was confirmed by the group.

6.2. Driving demonstration for CPs

The Chairman thanked Japan for organisation of the drive event for contracting parties on 24. November 2015

7. Discussion for draft proposal to amend Regulation 79

7.1. Discussion on document ACSF-04-03

ACSF-04-03 (F) Proposal for amendments in R79 based on ACSF-03-16

Main content of the document from (F):
Remove CAT D and CAT E from Regulation 79 and install it in a new Regulation.
Longitudinal control should not be part of the Regulation 79.

(Chair): In the last WP.29-session, the Chairman of the GRRF (Bernie Frost) reported to the delegates the current work of the IWG ACSF and also, why the group has started with CAT E.

It is clear, that the Regulation 79 is not the best "location" for ACSF in total, but to finalize this work in the given timeline, only this approach seem to be the most appropriate. WP.29 did not disagree with this.
(OICA): Proposes to go on with the current working strategy.
(D): All have agreed to go this way, also parking systems are needing braking functions.
(CLEPA): The current way was already confirmed by GRRF
(see: **GRRF-79-31** - (Chair) Guidance to GRs concerning Automated Driving Technology)

With regard to the current activities to the ACSF amendments in Regulation 79 the ongoing work of the Ad hoc group on LKAS was discussed.
(SE): Do we need to have the LKAS amendments in Regulation 79, or can we wait for CAT B of the new ACSF amendments?
(NL): It is better to use ACSF CAT B.
(OICA): Current systems are corrective steering functions, CAT B is an automated steering function, where maybe hands-off could be possible.
(Chair): Maybe we will have in the future CAT B1 (hands-on) and CAT B2 (hands-off)
(Chair): Proposal for ongoing activities of the LKAS work:
Freeze the activities on LKAS and wait for the result of the outcome of ACSF.
(EC): Agreed to proposal of the chair

7.2. Discussion on document ACSF-04-15

ACSF-04-15 (J) Results of the Study

Results of the Study
on ACSF Transition Time

Main content of document from (J):
To study transition from ACSF to the driver using a driving simulator when the driver needs manual operation while using the ACSF on a highway. CPs have been part of the study

(OICA): Have the subtasks been switched off when the warning was issued
(J):No.
(D): Presentation is very helpful for the discussion.
(SE): This was a very useful experience
(NL): The people in the study have been aware that something will happen. So the values seem to be the "minimum"
(D): situation in the test was very realistic, because the drivers where partly very drowsy (ed. because of jetlag…)
(SE): Why is (in slide 17) the response time of the driver without warning faster than with warning?
(J): Interpretation: The driver is more relaxed when he expect, that the system will warn.

(OICA): at least it should be clear, that a is not possible, before a failure in the system occurs.
(Chair): it was not a failure, it was the misinterpretation of the system.
(Chair-J): the warning time is also the time, when the failure occurs and the system is still working
(Chair): Summary of the discussion:

- 2s should be the minimum
- 4s are appropriate

(Chair-J): supports the 4s
(SE): maybe already 2s could be helpful as an "emergency system"

(see also the "warning table" in 7.4)

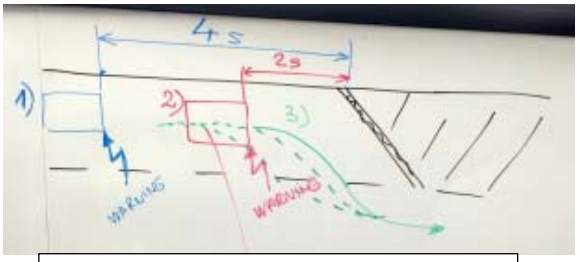
7.3. Discussion on document ACSF-04-14

Survey on the transition time from ACSF to Manual Driving

ACSF-04-14 (J) Survey Transition Time

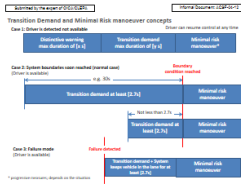
Main content of document from (J):
To obtain the experimental data of the transition time from ACSF system to Manual driving based on simulator study.

(OICA): explained the warning cascade on the whiteboard
(SE): has concerns about the numbers
(NL): confirms statement of SE, he thinks, the numbers may be too low.
(OICA): 4s should be sufficient. Also calculations in the SAE document is showing this.



Warning time =2s + car slows down
⇨ TTC increases up to 4s

7.4. Discussion on document ACSF-04-12 / 04-12-Rev1



ACSF-04-12 (OICA-CLEPA) Industry input - concept of Transition Demand (TD) and Minimal Risk Manoeuvre (MRM)
ACSF-04-12-Rev1 (OICA-CLEPA) Industry input - concept of Transition Demand (TD) and Minimal Risk Manoeuvre (MRM)

Main content of document from (OICA/CLEPA):
Transition Demand and Minimal Risk manoeuver concepts

The delegates discussed about the values of the timing for Warning, Transition time and Minimal risk manoeuvre. The timing for returning the driving task back to the driver in case of end of the "ACSF-road", exit from this road or bringing the driver back, if it seems, that he is no more in the situation to resume control in time, are uncritical as the ACSF controlled vehicle is working perfectly. More critical is the timing in case of a sudden, unexpected event and in case of a failure in the system.
The outcome of the discussion is reflected in the new generated document: ACSF-04-18, which is shown below and in an update of the OICA/CLEPA document ACSF-04-12-Rev1.

Submitted by the Secretary

Informal Document: ACSF-04-18

Warning/Transition Time CAT E Systems

Situation	D	J	EC	SE	NL	ROK	OICA	CLEPA
Normal	4,0 s	4,0 s	4,0 s	4,0 s*	4,0 s	4,0 s	4,0 s	4,0 s
Emergency	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly
Failure	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly
red. "functionality" after failure detection	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s***	4,0 s***
Reaction after this	MRM	MRM	MRM	MRM	MRM	MRM	MRM**	MRM**

*: plus time for the driver to react (e.g. toll)

**: depending on failure condition
***: in case of a sensor failure

Examples for "normal" Situation (expected end of ACSF)
End of highway coming soon
Exit in coming soon

Examples for "emergency" Situation
Missing lane markings
lane ends / merging lanes
obstacle on the road

Failure / not availibility of the system
System is temporarily not available

7.5. Discussion on document ACSF-04-05

ACSF-04-05 (D) Safe Distance Requirements for ACSF

Safety Distances and Object Classifications for ACSF

Main content of document from (D):
In this document, (D) summarized their expectations about the performance requirements of the ACSF system of detecting other road users around the vehicle when the ACSF-system is active.

(CLEPA): 176m is very challenging for the systems
(D): if necessary, the vehicle speed should be adapted to the sensor performance
(NL): The sensor requirements should be reflected in the text
(OICA): would favor to include the requirements in the test specification
(J): Speed of the vehicle must be considered

7.6. Discussion on document ACSF-04-04

ACSF-04-04 (D) Protective Braking for ACSF

Protective Braking for ACSF

Main content of document from (D):
Purpose of this document is to describe the necessities of the braking system when using the ACSF system.

(OICA): Overriding of the driver should always be possible.
(D): Group should decide this
(Chair): At least brake apply should be always possible
(D): Target is, that a wrong intervention of the driver may not lead to a false reaction of the system
(Chair): Overriding of the system could be “made difficult” for a certain time
(OICA): IS EM1B really necessary, as EM1A and EM2 should be sufficient
(EC): EM1B-Test: Are the systems be able to perform the test without a need to hand over to the driver?
(OICA/CLEPA): Yes
(ROK): Are the three tests because of safety?
(D): Yes, to cover the complete speed range
(J): Is there experience with regard to the EM1A test
(D): Yes, but a test track of $\geq$ 400m is necessary

7.7. Discussion on document ACSF-04-06

ACSF-04-06 (D) - ACSF-Lane Change Test for ACSF

Lane Change Test for ACSF

Main content of document from (D):
Purpose of this document is to describe a lane change test for ACSF systems

(OICA/CLEPA): Isn’t it better to make a static test, as explained in ACSF-03-05?
(D): The aim was to make the tests as simple as possible, but , a dynamic test is more realistic and so more appropriate.
(J): Isn’t it better to use the “national” max. speed
(D): Vehicles may be also exported to countries, where the speed limit is higher, so the functionality should be tested according with the proposed speed Δ.
(J-Chair): Confirms, also the higher speeds should be tested in Japan.

Homework: OICA to review this document

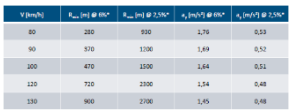
7.8. Discussion on document ACSF-04-07

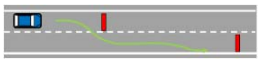
ACSF-04-07 (D) - ACSF-Minimal Risk Manoeuvre

Minimum Risk Manoeuvres (MRM)

Main content of document from (D):
Purpose of this document is to describe manoeuvres to minimize the risk in case the driver does not take over steering

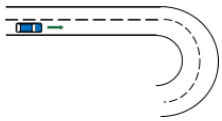
(all): The delegates confirmed, the in future the name of MRM is: **Minimal** Risk Manoeuvre
(D): This is a bundle of tests, and we should select, which tests is necessary
(SE): Appropriate test tracks have normally an inclination, was this considered?
(D): No, to perform the test a test track with minimum inclination should be used. Also an adjustment in the speed could solve this issue.
(OICA): How does the table (page 11) shall justify the 3m/s²?
(D): The table should show, that with 3m/s² we are on the safe side.





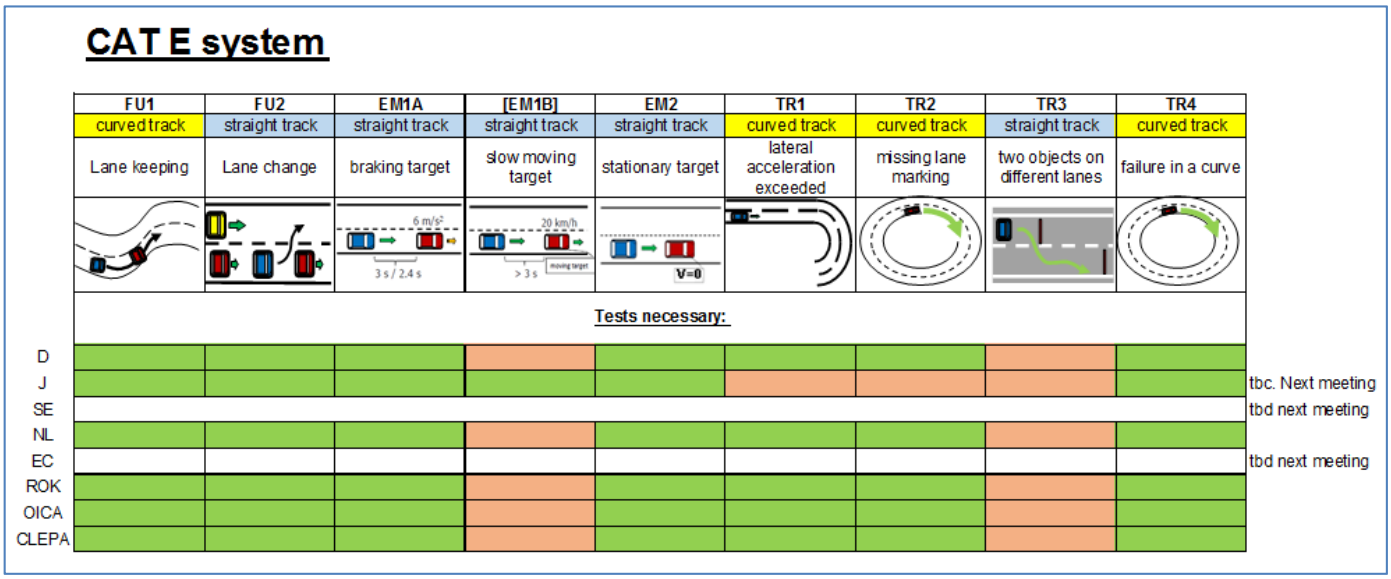
(D): TR3: Lane change is not mandated, also stopping is possible.

(OICA): In CAT A-C systems are always in responsibility of the driver.
(D): For transition demand and MRM it is needed
(OICA): If the MRM has to be performed in failure conditions too, this would then be a level 4 system. – We should consider, that the driver is still in the loop.
(D): We have the choice to select the tests which seem to be necessary
(Chair): This depends on the Driver Recognition System. If this works quite well, tests may be obsolete.



(SE): Are the 3m/s² in TR1 also good for heavy vehicles?
(OICA): 3m/s² is too much for heavy vehicles. Maybe a new value is necessary, which may perhaps been specified by the vehicle manufacturer.
(Sekr): Do we assume, that at every failure a transition period plus the MRM should be performed?
(D): In reality, there may be failures, which cannot handle a MRM by the system.
(J-Chair): Are only CAT E systems considered at this time?
(D): Yes
(Chair): We should try to combine tests if possible.

Summary of the discussion of the necessity of the tests:
(green: test is necessary - red: test is not necessary)



7.9. Discussion on document ACSF-04-17

CSF-04-17 (D) German Proposal based on ACSF-03-16

Main content of document from (D):
Purpose of this document is to include the content of the shown presentations.

7.9.1. 5.6.1.1.8

Proposed amendment:
The vehicle shall be equipped with means to detect and classify obstacles and other road users at least 176m in front of the vehicle, 8m at the left and right side of the vehicle and 113m behind the vehicle.

(OICA): Are the values necessary?
(D): This is just a first text proposal to reflect the content of the presentation ACSF 03-05. It is necessary to define the performance of the sensors.
(NL): Values are necessary – "objects" should be defined more clearly
(SE): Should we define the values in the test?
(D): We do not have tests to cover that all. We test the rear range of the sensors in the new lane change test FU2 and the front sensors are tested also in the braking tests.
(EC): Requirements are necessary, wording should be improved (including "safety distance")

Homework: D + CLEPA to make a new proposal
(incl. values f(Vsmax) and definition of "objects")

7.9.2. 5.6.1.6

Proposed amendment:

5.6.1.6. Protective Breaking

5.6.1.6.1. Any vehicle equipped with an ACSF of category E shall meet the following requirements for protective braking.

5.6.1.6.1.1. If the activated system detects that the distance to other road users in front is less or will shortly be less than the foreseen safety distance and that the time for a safe transition procedure is too short, a protective braking shall be carried out.

5.6.1.6.1.2. If the activated system detects that due to a sudden unexpected event the vehicle is in imminent danger to collide with another road user in front and that the time for a safe transition procedure is too short, a protective braking shall be carried out.

5.6.1.6.1.3. The protective braking must be able to deliver the full braking force of the vehicle in order to achieve a maximum deceleration.

5.6.1.6.1.4. The tests EM1A and EM1B and EM2 as specified in Annex 7 shall be fulfilled.

(D): A requirement to prevent unintended overriding should be included here
(OICA): Is "protective braking" as a special paragraph necessary, or is it part of "emergency manoeuvre" (2.4.8.15)?
(D): "Protective braking" is not only for emergency cases, also for "standard" ACC braking.
(OICA): Also other measures can be used to adjust the speed.
(Chair): Maybe a change to "braking requirements" could be helpful
(J): Is a digital map always necessary for ACSF systems?
(OICA): No, not in general.
(J): How can a test been performed, if the test track is not in the digital map?
(OICA): The test track can be included in the digital map, but this cannot been confirmed under all conditions today.

Homework: D to propose a new text (considering 5.6.1.2.5)

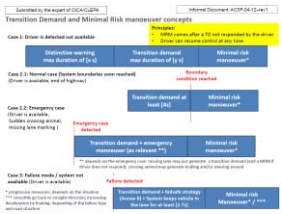
7.9.3. Annex 7 – 3.1.2 Functionality Test 2 (FU2)

Homework: D to generate a text

7.9.4. General issues to tests

(NL): We should also consider pedestrians
(Chair): People on the highway are not allowed
(J): As pedestrians are also "objects" this should be already covered in the new German proposal.
(SE): We should also expect, that large animals are also considered as "objects"

7.10. Discussion on document ACSF-04-12-Rev1



ACSF-04-12-Rev1 (OICA-CLEPA) concept of TD and MRM

Main content of document from (OICA):
Purpose of this document is to show the industry concept on Transition Demand (TD) and Minimal Risk Manoeuvre (MRM)

(J):Is expecting 4s as safety aspect
(NL): Confirms (J) statement, 4s is already the minimum.
(Chair): Believes, that development will go on and expects, that until the regulation will get into force, the 4s can be achieved
(J-Chair): OICA and CLEPA to think about the 4s

The final status to this issue is apparent in ACSF-04-18

Submitted by the Secretary

Informal Document: ACSF-04-18

Warning/Transition Time CAT E Systems

Situation	D	J	EC	SE	NL	ROK	OICA	CLEPA
Normal	4,0 s	4,0 s	4,0 s	4,0 s*	4,0 s	4,0 s	4,0 s	4,0 s
Emergency	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly
Failure	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly	immediatelly
red. "functionality" after failure detection	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s	4,0 s***	4,0 s***
Reaction after this	MRM	MRM	MRM	MRM	MRM	MRM	MRM**	MRM**

*: plus time for the driver to react (e.g. toll)

**: depending on failure condition
***: in case of a sensor failure

Examples for "normal" Situation (expected end of ACSF)
End of highway coming soon
Exit in coming soon

Examples for "emergency" Situation
Missing lane markings
lane ends / merging lanes
obstacle on the road

Failure / not availibility of the system
System is temporarily not available

7.11. Discussion on document ACSF-04-11

ACSF-04-12-Rev1 (OICA-CLEPA) concept of TD and MRM

Main content of document from (NL):
Homework NL 3rd meeting

5.6.1.4.4 was already discussed

5.6.1.1 System should only be able to be activated, if the system is actually in the condition, where ACSF is allowed.
A “deliberate action” should be a clear activity of the driver, that he wants to activate the system.

7.12. Discussion on document ACSF-04-09

ACSF-04-12-Rev1 (OICA-CLEPA) concept of TD and MRM

Main content of document from (ROK):
Comments to ACSF-03-16

The proposed amendments of the ROK-document have been discussed.
The Chair asked (D) to consider the ROK comments in the next text proposal.

Homework: D to consider document ACSF-04-09 in the next text proposal

7.13. Discussion on document ITS/AD-07-02

ACSF-04-12-Rev1 (OICA-CLEPA) concept of TD and MRM

Main content of document from (ITS/AD-Group):
Results of the ATS/AD group meeting from ITS/AD-07-02

(J-Chair): Informed the delegates about the result of the last ITS/AD session.
- ongoing work
- cyber security (new guideline can be expected until next meeting in 03/16)
- ACSF categories
- EDR

7.14. Discussion on document ACSF-04-13

ACSF-04-12-Rev1 (OICA-CLEPA) concept of TD and MRM

Main content of document from (OICA/CLEPA):
Comments to ACSF-03-16 and homework of the last session

7.14.1. Definitions:

"Motorway" Definition:
Again a lengthy discussion with regard to the definition of the roads where ACSF shall be allowed.

(D): Speed limit should be taken out of the definition
(Sekr): was a proposal of UK in the 2nd session
(SE): Should it really work only on "motorways", otherwise we should define it different.
(D): Support (SE) comment, we should define it as a "ACSF-road" with a specific definition.
(J): Exclude speed limit
(OICA): New definition is preferred. Proposal to reference to the Vienna Convention .
(SE): This seems not to be helpful, as it is up to the countries to define "motorways"
(OICA): If we have no clear definition, it is difficult for the system to detect the road.

Homework: D to make a new proposal

2.4.8.8 ➔ amended
all amendments, see ACSF-04-20 (Secretary) Consolidated Document after 4th session
2.4.8.13 ➔ amended
2.4.8.14 ➔ amended
2.4.8.15 ➔ amended

7.14.2. 5.4.3.1 (Special Warning Provisions)

5.4.3.1 ➔ amended

7.14.3. 5.5.2 (PTI)

(Chair): no SW-Update should be possible, which is not approved by the Technical Service
(SE): Every system needs a diagnosis system. Do not rely on the OBD connection, but more on the "internal" ECU diagnosis.
(NL): The info, which is provided to the driver should also be enough for the PTI.
(SE): Confirms (NL) statement. The SW shall check, that the SW is updated.
(OICA): For this you would need a special SW, checking the SW status of the other ECUs. For PTI it should be enough to know, whether there is a failure or not. This can be the same information, which is provided to the driver in real TIME:
(SE): It could not be the purpose of the PTI to check, whether every system has the correct SW status. This is within the responsibility of the driver and the manufacturer.

Homework: All, to think about this issue
Homework: EC, SE, J, D to prepare the requirements for PTI until the next meeting

7.14.4. 5.6.1.1. (General)

5.6.1.1.3 ➔ amended
5.6.1.1.5 ➔ amended
5.6.1.1.7 ➔ amended

7.14.5. 5.6.1.2 (Operation of ACSF)

5.6.1.2.4 ➔
Homework: D to rework wording

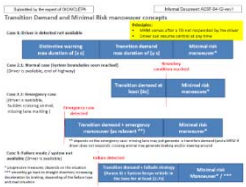
5.6.1.2.5 and 5.6.1.2.6 (Driver monitoring)
Discussion, what a ACSF system must be able to monitor, what a driver is doing or whether he is available.
Must we consider, that the driver is reading a book?
Must a ACSF-driven car be better, than a tired driver in a vehicle with conventional systems?

(D): Monitoring of "attentiveness" of the driver is today not possible.
(Chair): We should not bring a work load to the manufacturer, to solve issues, which are caused by the driver.
(SE): Sees two solutions, where one of them has to be fulfilled:
1. Attentiveness is monitored by the system (e.g. eye recognition)

2. Seat occupancy + driver attention by confirmation of the driver every 10s
(NL): supports (SE)
(D): Confirmation of the driver shall also include, that he drivers presence can be checked by the system by evaluating the usage/handling of on-board systems
(J): Supports (SE)
(ROK): no opinion
(EC): supports (SE)

Homework: SE to create a new proposal

7.14.6. 5.6.1.4 (Transition demand)



(OICA) Presented the document ACSF-04-12-Rev1

Homework: OICA to rework this paragraph
using ACSF-04-18 and Japan comments

7.14.7. 5.6.1.5 (Minimum Risk Manoeuvre)

According OICA proposal the wording in the document was renamed from:
Minimum Risk Manoeuvre ➔ **Minimal** Risk Manoeuvre

(SE): If the driver does not react, we want to safe the driver, or the other traffic participants
5.6.1.5.1 ➔ amended
5.6.1.5.2 ➔ amended
5.6.1.5.3 ➔ deleted

7.14.8. Annex 7

The group discussed **the proposal of OICA (see 3.4.x in ACSF-04-20)**

The Manufacturer shall provide the Technical Service authorities with an explanation of the design provisions built into the ACSF so as to prevent unauthorized manipulations of hardware or software.
For the design of these protective measures, the manufacturer may assume that the protection against unauthorized physical access to the vehicle systems is assured by the means defined elsewhere in the UN-ECE regulatory framework or by equivalent means.

(Chair): thinks that a direct reference is necessary
(NL): agreed, that this would be a good proposal. Would be a reference to a safety standard of the SW be necessary?
(SE): Can we wait for a standard developed for SW security, will it not take too long time?
(Chair): The ITS/AD group will follow this issue and will make recommendations
(J-Chair): We should wait for the recommendations, which are expected to be available in 1Q/2016
(EC): supported the statements of the Chairs.

8. Other business

No issues

9. List of action items:

ACSF-04-06	review this document	OICA
ACSF-04-17	5.6.1.1.8 -> make a new proposal	D + CLEPA
	5.6.1.6.(Protective Breaking) -> propose a new text (considering 5.6.1.2.5)	D
	Annex 7 – 3.1.2 Functionality Test (FU2) -> generate a text	D
consider document ACSF-04-09 in the next text proposal		D
ACSF-04-13	Motorway" Definition -> make a new proposal	D
	5.5.2 (PTI) -> prepare the requirements for PTI until the next meeting	EC, SE, J, D
	5.6.1.2.4 -> rework wording	D
	5.6.1.2.5 and 5.6.1.2.6 (Driver monitoring) -> create a new proposal	SE
	5.6.1.4 (Transition demand) -> rework this paragraph using ACSF-04-18 and Japan comments	OICA

10. Schedule for further meetings.

5th session IWG ACSF: 20.-22.Janaury 2016
Details will follow soon

Rev.	Date	Content