Finalized Minutes
10th Flex-PLI Technical Evaluation Group (Flex-TEG) Meeting
Date: 1st - 2nd December 2009 (10:30 – 17:30)

Place: BASt (http://www.bast.de/) – Bergisch Gladbach, Germany

Attendants

A. Konosu （Chairperson/J-MLIT/JARI）
M. Burleigh （Secretariat/FTSS-Europe）
O. Zander (BASt)
D. Gehring and P. Lessmann (BGS)
J. Stammen (NHTSA/VRTC) by WebEx
A. Malloy (TRC) by WebEx
Y. W. Yoon (K-MLTM/KATRI)
R. Fleischhacker (ACEA/Porsche)
T. Kinsky (ACEA/Opel)
C. Hohmann (ACEA/VW)
C. Hess (ACEA/Audi)
N. Lubbe (ACEA/Toyota Europe)
Y. Takahashi (JAMA/Honda R&D)
W. Liebers (TUV Rheinland Group)
K. Wolff (Continental)
J.C. Kolb (Bertrandt AG)
D. Martin (DTS) by WebEx
M. Winkler (MESSRING)

1. Opening: Welcome and Self introduction

- The Chairman expressed his appreciation to the participants as well as to BASt, who provided the conference room.
- Members made self introductions.

2. Finalization: Draft Agenda of the 10th Flex-TEG Meeting

- The draft agenda for the 10th TEG meeting (TEG-110) was discussed.
- The draft agenda was finalized by adding some materials proposed by BASt and FTSS (TEG-110-Rev. 1).

3. Finalization: Draft Minutes of the 9th Flex-TEG Meeting

- The draft minutes of the 9th TEG meeting (TEG-109) were discussed.

- JAMA explained the amendment proposal that had been preliminarily distributed, and its contents were approved.
- BASt explained the additional amendment proposal, and it was approved.
- The minutes were finalized to reflect the above mentioned amendments (TEG-109-Rev.1).

4. Confirmation: Status of the Action Items

- The status of action items was confirmed (TEG-111).
- FTSS reported, "The manual for Flex-GTR is in the final stage of preparation and will be distributed to persons related to TEG activities after undergoing checks by BASt-BGS and JAMA-JARI."
- The status of action items was finalized after being partially updated (TEG-111-Rev. 1).

5. Information: Flex-GTR-prototype Technical Evaluation Test Results

5.1. NHTSA

- The results of the evaluation test on the Flex-GTR-prototype conducted by NHTSA were reported (TEG-112).
- NHTSA stated, "Although Flex-GTR is more durable than Flex-GT, additional confirmation is required because no tests using Flex-GTR have yet been implemented on those US vehicles that do not meet the current gtr9 criteria. Verification of the biofidelity to the human body, reproducibility of the impactor (there is no experience of using multiple impactors), additional tests on vehicles with low protection of pedestrians, and tests on large vehicles in US should be addressed."
- The Chairman commented, "Each automobile manufacturer has already established the technology to meet the current gtr9 criteria, and it is difficult to imagine that each automobile manufacturer will test vehicles that do not meet the current gtr9 criteria at all. Furthermore, we believe it is unnecessary to test vehicles that do not meet the current gtr9 criteria at lab of automobile manufacturers because automobile manufacturers commonly develop vehicles using computer simulation models and use actual impactors only for final or final phase verification tests."
- NHTSA asked, "Does Flex-GTR have reproducibility problems?"

- The Chairman answered, "Verification tests implemented by JAMA-JARI and BASt have already confirmed that the Flex-GTR does not have reproducibility problems. Furthermore, in principle, there is no concern about reproducibility because impactors will be manufactured by a crash test dummy maker using the corridor of calibration tests of impactor."
- The Chairman asked, "What are the plans for the "Verification of biofidelity" described in the NHTSA action plan?"
- NHTSA answered, "The biofidelity of impactors will be rated using the biofidelity ranking system. The biofidelity of Flex-GTR will be compared with the current EEVC-WG17 Pedestrian Lower Legform Impactor."
- DTS reported, "All software issues on the onboard DAS "SLICE" that occurred during the tests at NHTSA have been resolved (TEG-123)."

5.2. KATRI

- The results of evaluation tests using Flex-GTR (SN03) implemented by KATRI were reported (TEG-113).
- KATRI commented, "As a result of implementing tests using Flex-GTR (with one actual vehicle), repeatability was roughly Good or Acceptable, but only the dispersion of PCL was large. There were no significant problems in durability, usability, or stability, but minor modifications are required."
- Mr. Kinsky (ACEA/Opel) asked, "What is the stance of Korea in the 46th GRSP?"
- KATRI answered, "I cannot answer that right now because, another engineer from KATRI will attend the 46th GRSP. However, there is no particular plan to submit a document to explain the Korea stance."

5.3. ACEA

- ACEA presented a status report on the present condition of ACEA (TEG-114).
- ACEA commented, "Some round-robin tests (by at least three manufacturers) and technical feasibility studies have not been completed. ACEA requests that a Flex-TEG meeting be held before the next GRSP in May 2010."

- The Chairman answered, "We cannot answer whether to hold an additional Flex-TEG meeting or not at present. We will take it back and consult with the Ministry of Land, Infrastructure and Transport of Japan."
- MESSRING commented, "All problems on the onboard DAS "M=BUS" that arose during the ACEA tests have been solved. If any trouble occurs in the future, we will respond immediately, so please report it to us."

5.4. JAMA

- JAMA answered, "The results of the round-robin tests by JAMA have already been reported at the 9th Flex-TEG meeting (TEG-105). There are no additional reports."

5.5 BASt-ACEA: Influence of test parameter variations on the Flex GTR

- BASt-ACEA reported analysis results for the parameters of the test conditions for Flex-GTR (TEG-115).
- BASt stated "These results can be utilized in examinations for setting tolerances of test conditions for Flex-GTR. Besides, we have a plan to examine the influences of other angles, influences of temperature, and influences of combinations of these in the future."

5.6. BASt: Proposal for Impact test parameter tolerances

- BASt-ACEA made a proposal concerning the tolerances of the test conditions for Flex-GTR (TEG-116). The values proposed are as follows.

- Test temperature: 20±2 degrees Celsius (inverse calibration), 20±4 degrees Celsius (actual vehicles)
- Test speed: 11±0.2 m/s (inverse calibration and actual vehicles)
- Height of collision: 0±2 mm (inverse calibration), 75±8 mm (actual vehicles)
- Test angle (Pitch angle): 0±2 degrees (inverse calibration and actual vehicles)
- Test angle (Roll angle): 0±2 degrees (inverse calibration and actual vehicles)
- Test angle (Yaw angle): 0±2 degrees (inverse calibration and actual vehicles)

- The above were approved after discussions at TEG that the height of collision should be changed to 75±10 mm (actual vehicles) and the test angle (Yaw angle) to 0±5 degrees (actual vehicles) from the viewpoint of feasibility.
- Items agreed to by TEG are summarized below.

- ✓ Test temperature: 20±2 degrees Celsius (inverse calibration), 20±4 degrees Celsius (actual vehicles)
- ✓ Test speed: 11±0.2 m/s (inverse calibration and actual vehicles)
- ✓ Height of collision: 0±2 mm (inverse calibration), **75±10mm** (actual vehicles)
- ✓ Test angle (Pitch angle): 0±2 degrees (inverse calibration and actual vehicles)
- ✓ Test angle (Roll angle): 0±2 degrees (inverse calibration and actual vehicles)
- ✓ Test angle (Yaw angle): 0±2 degrees (inverse calibration), **0±5 degrees** (actual vehicles)

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6. Finalizations: Flex-GTR Specifications (Usability)

6.1. FTSS: minor update presentations and CAE status

- FTSS reported a draft of minor updates on the usability of Flex-GTR and the state of development of a finite-element model of Flex-GTR (TEG-117).
- TEG: Approved the draft of minor updates. However, the catching rope for impactors should be optimized after discussions with persons concerned.
- FTSS reported, "The finite element model of Flex-GTR (already verified) will be released around February 2010."

7. Finalizations: Dynamic Calibration Test

7.1. Requirement Corridors (for Inverse Test and for Pendulum Test)

- BASt made a proposal concerning the test conditions for the inverse-type calibration test method and the calibration test corridor (TEG-119).
- After discussions, TEG approved the BASt draft.
- TEG also agreed to set the mass tolerance of Ram used for the inverse-type calibration test

to ±50g.

- JAMA-JARI made a proposal concerning the calibration test corridor for the pendulum-type calibration test method (TEG-120).
- After discussions, TEG approved the JAMA-JARI proposal.
- Chairperson stated "If any amendment becomes necessary for the calibration test method/corridors in the future, updates will be made using the amendment proposal form of gtr9."

8. Finalizations: Injury Threshold Values

8.1. Tibia

- The Chairman confirmed the opinions of related groups concerning the value of injury criteria for the tibia.
- JAMA: We agree to 340Nm and do not make any proposal for a relaxation zone by ourselves.
- ACEA: We agree to 340Nm. However, technical feasibility studies are required as to whether to set a relaxation zone is necessary or not.
- BASt: If ACEA need to set a relaxation zone for tibia, evidence on the technical feasibility need for a relaxation zone must be presented.
- After discussions, it was decided that the value of injury criteria for the tibia should be 340Nm and the relaxation zone should be left in [ ] at the moment.
- Chairperson stated "If ACEA requests a relaxation zone for the tibia in the future, its necessity should be discussed mainly between BASt and ACEA at first."

8.2. MCL

- The Chairman confirmed the opinions of related groups concerning the value of injury criteria for the MCL.
- JAMA: We agree to 22mm.
- ACEA: We agree to 22mm.
- After discussions, the injury criteria for the MCL was established as 22mm.

8.3. ACL/PCL (BASt Information, No further discussions)

- First, the Chairman declared, "Whether to establish the injury criteria for the ACL/PCL or not has already been set as a GRSP matter, so it should not be discussed at TEG. It will be discussed at the GRSP, so we only listen to your opinions here (no further discussions) if you have."
- BASt reported the newest analysis results on the ACL and PCL matter (no TEG official number).
- The Chairman directed that it is OK to submit to the GRSP as an informal document, if necessary.

9. Finalizations (remove brackets): Proposal for gtr 9 amendments submitted to GRSP by Japan in Sep 2009 (ECE-TRANS-WP29-GRSP-2009-21e.pdf)

9.1. Transition Period (EEVC WG17 Impactor -> Flex-PLI)

- The Chairman confirmed the opinions of related groups concerning the period of transition from EEVC to FlexPLI.
- ACEA: We believe that eight years (96 months) is required for incorporating the model cycle, etc. It is desirable that re-acquisition of certification with Flex-PLI not be required once certification is obtained with EEVC.
- JAMA: We agree with ACEA. Furthermore, the period of transition should be clearly specified as eight years after enforcement of the related law in each country.
- BASt – NHTSA: The period of transition is the assigned area of the attendants to GRSP and should not be discussed at TEG.
- After discussions, TEG agreed to include the following in the preamble of the law.

- (a) Some TEG members proposed that the period for using alternative impactors of EEVC WG 17 pedestrian lower legform impactor or FlexPLI should end 96 months after the date of entry into force in the respective national legislation for each contracting party "
- (b) Some TEG members also propose that a vehicle model once certified using the EEVC

WG 17 pedestrian legform impactor does not need to be re-certified using the FlexPLI.

9.2. General Specifications of Impactor (Mass, C.G. and Inertia)

- JAMA-JARI made a proposal concerning the mass, position of gravity center, and moment of inertia of FlexPLI (TEG-122).
- After discussions, TEG approved the proposal of JAMA-JARI.
- Chairperosn stated "If an amendment becomes necessary in the future, updates will be made using the amendment proposing form of gtr9."

9.3. Car Test Methods (Tolerances of Impactor Statue and Impact Position to the Car)

- TEG agreed that the test conditions with actual vehicles for Flex-GTR should be based on the results of discussions on Agenda 5.6.

10. Future Action Plans

- The Chairman confirmed future action plans.
  - ACEA: Continuous implementation of remaining round robin tests and technical feasibility studies.
  - BASt-ACEA: Discussions on the necessity of a relaxation zone for the tibia.
- It was agreed that the request by ACEA for holding the next TEG meeting (before next GRSP in May 2010) will be brought back by the Chairman for consultation with the Ministry of Land, Infrastructure and Transport of Japan.

ACTION-056

- ACEA will implement remaining round robin test and technical feasibility studies by the next GRSP meeting.

ACTION-057

- BASt-ACEA will discuss the necessity of a relaxation zone for the tibia by the next GRSP meeting.

ACTION-058

- The Chairman will consult with the Ministry of Land, Infrastructure and Transport of Japan about ACEA's request to hold the next TEG meeting before next GRSP in May 2010.

11. Status report for the 46th GRSP Meeting (Dec. 2009)

11.1. Make Summary Report of Flex-TEG meeting up to 10th Flex-TEG meeting

- The Chairman stated, "I will prepare the Summary Report for TEG within a few days after the TEG meeting, so I request TEG members to review it."
- The TEG members agreed.
- The Chairman also commented, "We prepared background discussions at the 9th TEG meeting concerning injury criteria and calibration tests in collaboration with Mr. Zander (BASt) for explanation at the 46th GRSP (which will be presented when requested by GRSP), so we request the attendants to the 9th TEG meeting to review them within a few days."
- The TEG members agreed.

ACTION-059

- The Chairman will prepare a Summary Report for TEG within a few days and distribute it to TEG members for finalization.

ACTION-060

- Attendants of the 9th TEG meeting will review "Data of background discussions at the 9th TEG meeting concerning injury criteria and calibration tests" prepared by the chairman and Mr. Zander (BASt) within a few days to contribute to its finalization.

12. AOB

- Mr. Hohmann (ACEA/VW) asked, "We want to mount different type of onboard DAS on Flex, is this feasible? (similar size of SLICE and M=BUS but different maker's one)"

- Mr. Burleigh (FTSS) answered, "I believe it is feasible. Please contact me separately and then tell me the details of the onboard DAS."
- Mr. Kinsky (ACEA/Opel) requested, "Please provide us with more detailed information on the additional mass, etc. which are used for the pendulum-type dynamic calibration test."
- Mr. Burleigh (FTSS) responded, "I understand. We will add more detailed information on the pendulum-type dynamic calibration test to the proposal for amendment of gtr9."
- Mr. Zander (BASt) commented, "We want to change the method for the pendulum-type dynamic calibration test from Type 3 to Type 1 (no flesh, no additional mass)."
- The Chairman answered, "Type 1 has a low load level against the impactor, so we cannot recommend its use. We would like to maintain Type 3 (with flesh and additional mass)."
- The TEG members agreed.

ACTION-061

- Mr. Burleigh (FTSS) will include information on the additional mass, etc. used for the pendulum-type dynamic calibration test in the proposal for amendment of gtr9.

13. Closing

- The Chairman again expressed his appreciation to the participants as well as to BASt, who provided the conference room.
- In addition, the Chairman commented that the particulars of the next TEG meeting are undecided and that notification will be given separately regarding when it is to be held.

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