

Finalized Minutes

The 7th Flex-PLI Technical Evaluation Group (Flex-TEG) Meeting

Date: December 8th, 2008 (10:30 – 17:30)

Place: BAST (<http://www.bast.de/>) – Bergisch Gladbach, Germany

Attendances

A. Konosu (Flex-TEG chairperson/J-MLIT/JARI), B. Been (Flex-TEG secretariat/FTSS-Europe),
O. Zander (BAST), D.U. Gehring and P. Leßmann (BGS),
O. Ries (ACEA/VW), R. Fleischhacker (ACEA/Porsche),
T. Kinsky and B. Dreyer (ACEA/GM Europe), A. Sipido (Ford-Germany),
I. Imaizumi (JAMA/Honda), W. Liebers (TUV), K. Wolff (Continental),
J. C. Kolb (Bertrandt AG), M. Winkler (MESSRING), D. Martin (DTS),
T. Inoue (JASTI), R. Kant and S. Jansen (FTSS-Europe), Total: 19 persons

1. Opening and Welcome

- The Chairperson expressed his appreciation to the participants and to BAST for providing the conference room.
- The members introduced themselves.

2. Finalization: Draft Agenda of the 7th Flex-TEG Meeting (TEG-069)

- The draft agenda for the 7th Flex-TEG meeting (TEG-069) was discussed.
- After the discussions, the draft agenda was finalized with several modifications (TEG-069-Rev. 1).

3. Finalization: Draft Minutes of the 6th Flex-TEG Meeting (TEG-068)

- The draft minutes of the 6th Flex-TEG meeting (TEG-068) were discussed.
- Mr. Zander proposed modifications to the Agenda 6.3.2 (paragraph 8: Mr. Zander ...); the minutes were subsequently finalized as modified (TEG-068-Rev. 1).

4. Confirmation: Status of the Action Items (TEG-070)

- The chairperson gave a report on the status of action items (TEG-070).
- The report on the status of action items was finalized with updated information included (TEG-070-Rev. 1).

5. Information: Flex-GTR-prototype Development

5.1. FTSS Report, Development report (TEG-071)

- Mr. Been reported on the Flex-GTR-prototype development (TEG-071) and described constructions of the three developed Flex-GTR-prototypes (SN01, Off-board DAS type; SN02, Onboard type (M=BUS); and SN03, Onboard DAS type (Slice)) and their calibration test results.
- Mr. Gehring asked, "Is it possible to change the Onboard DAS type to an Off-board DAS type?"
- Mr. Been answered, "Yes, it is possible and very easy to change. All of the sensors are connected to a common connector block, which is used for both DAS types. Therefore, just change the connector cables to convert from Onboard DAS type to Off-board DAS type."
- Mr. Gehring asked, "Are the impact covers, blue plastic covers, attached to the Flex-GTR-prototype body parts using double-sided tape as in the Flex-GT version?"
- Mr. Been answered, "Yes, they are. The same attachment methods are used. The method is very useful to protect impactor body parts from impact damage."
- A TEG member asked, "The tolerance of the Flex-GTR-prototype mass is +/- 2%. How did you decide that?"
- Mr. Been answered, "We just used the percentage of the tolerance for a crash test dummy. The TRL legform impactor has a wider mass tolerance. Therefore, we would like to discuss the mass tolerance with Flex-TEG members."
- Mr. Gehring asked, "The impact pad of the new pendulum test has a 10-degree angle, and a 5kg weight is added at the end of the impactor. How did you decide the test conditions?"
- Mr. Been answered, "The test conditions were decided based on the results of JAMA-JARI computer simulations that used the Flex-GT CAE model. We decided the test conditions based on the following two points. First, a car test level load is applied to the Flex-PLI. Second, the impact pad, which is attached at the impact face of the pendulum test rig, shall not be deformed too much with high stress concentrations."
- Mr. Kinsky asked, "The report states that a new bone core was developed. Does the new bone core exhibit the same response as the current one?"
- Mr. Been answered, "The new bone core response was validated by JAMA-JARI testing (quasi-static and dynamic test at the component and assembly levels). The two bone core responses were exactly the same, and the new one has higher durability than the current one. Therefore, we are making spare parts for the Flex-GTR prototypes with the new bone core."
- Dr. Ries asked, "Are the three Flex-GTR prototypes made using mass-production methods?"
- Mr. Been answered, "The three Flex-GTR-prototypes are made at the FTSS-US factory using our mass-production methods and according a complete and controlled drawing package, so if someone would like to purchase the Flex-GTR-prototype, it is available."

5.2. Japan (J-MLIT, JAMA, and JARI) Report, Evaluation Report (TEG-072)

- The chairperson gave a report on the Flex-GTR prototype evaluation tests in Japan (TEG-072) in which the repeatability and reproducibility of Flex-GTR prototypes and the comparability between the Flex-GTR-prototype and Flex-GT were evaluated.
- A TEG member asked, "Is the 'Slice', Onboard DAS, used in these tests?"
- The chairperson answered, "The 'Slice' connector was too stiff for release, so we could not use the 'Slice' for our testing. Therefore, we used off-board cables for the Flex-GTR prototype SN03. However, DTS Company is going to make an improved connector by the end of Dec. 2008, so after that 'Slice' can be used for testing."

5.3. Proposal to use ISO MME codes for Flex (TEG-073)

- Mr. Winkler gave a report on the proposal to make ISO MME codes for the Flex-PLI measurement items (TEG-073).
- After the discussions, Flex-TEG members agreed to make ISO MME codes for the Flex-PLI measurement items. The codes will use the same measurement axis as a crash test dummy. Mr. Winkler proposed that the impact direction is y direction, which was agreed by the group.
- The chairperson asked MESSRING and DTS to draft a proposal for the ISO MME codes for the Flex-PLI measurement items, and then send the proposal to Flex-TEG members.

Action-035

- **MESSRING and DTS will draft a proposal for the ISO MME codes for the Flex-PLI measurement items and then send the proposal to the TEG members.**

6. Discussions: Dynamic Calibration Method for Flex-GTR-prototype (Pendulum type or Inverse type)

6.1. FTSS Report, Pendulum type (TEG-074)

- Mr. Been gave a report on the "New pendulum calibration test" for the Flex-GTR prototype (TEG-074). The report recommended the new pendulum test because it is easy and low cost, and the test conditions are stable.

6.2. BASt Report, Inverse type (TEG-075)

- Mr. Zander gave a report on the "Inverse calibration test" for Flex-GT and the Flex-GTR prototype (TEG-075). The report recommended the inverse test because it can detect impactor damage very well and because it has loading conditions similar to those of a car impact test, including maximum loading and timing.
- Mr. Been replied, "Conditions may vary in the inverse test. Furthermore, it requires an impact test machine

(Dummy maker does not have such impact machine) and a non-reusable honeycomb is used, so its cost is high.”

- Mr. Zander stated, “(1) The repeatability and reproducibility has been proven as good within a huge amount of tests conducted amongst others within a joint project together with PDB, (2) The force-deformation characteristics of the honeycomb are expected to be quite constant. Several pendulum tests conducted at BAST in a former project have proven that, (3) The test method has to be chosen independently from whether the dummy manufacturer is able to conduct those tests or not because we have to examine the proposals just from the technical point of view. Besides, the WG 17 impactor certification has a "large scale" as well. Again, repeatability and reproducibility have been proven to be good within the inverse certification tests, (4) The proposed certification frequency is completely in line with the WG 17 legform certification. Besides, the test should be performed at least after every 20 tests or one year.
- Ms Sipido stated, “The inverse test conditions are much closer to those of the car impact test. It is very important to check the impactor validity under the car impact test conditions. Besides, the inverse test can detect impactor damage better than the pendulum tests.”
- The chairperson added, “If the impactor is damaged (bone core breaks, knee ligaments break, etc.), the pendulum test also can detect the impactor damage because the impactor response varies significantly.”
- Mr. Liebers proposed, “It is better to think about the purpose of the calibration test. The test shall be decided the impactor damage. It’s a very important purpose of the calibration test method.”
- After discussion, the TEG decided to continue this discussion until the next TEG meeting.

Action-036

- **TEG members will continue discussing which calibration test method is the better, the pendulum test or the inverse test, until the next TEG meeting.**

7. Discussions: Injury Criteria (How do we treat the ACL and/or PCL injury criteria, etc.)

7.1. Injury Threshold for the Flex-PLI MCL, JAMA Proposal (TEG-076)

- Mr. Imaizumi gave a report on the JAMA proposal for the MCL injury threshold of the Flex-PLI (TEG-076). The report recommends considering muscle effects and high bumper effects in determining the MCL injury thresholds.

7.2. Injury Threshold for the Flex-PLI Tibia Bending Moment, JAMA proposal (TEG-077)

- Mr. Imaizumi gave a report on the JAMA proposal for the Tibia bending moment of the Flex-PLI (TEG-077). The report recommends using 318Nm for the tibia injury threshold, which is an average of previously

proposed thresholds (299Nm and 337Nm).

7.3. Injury Threshold for the Flex-PLI ACL, PCL, and MCL, BAST proposal (TEG-078)

- Mr. Zander gave a report on the BAST proposal for the ACL, PCL and MCL thresholds of the Flex-PLI (TEG-078). The report states that, for the time being, 12.7mm ACL/PCL elongation could be proposed as a threshold for monitoring purposes only; 16mm and/or 20mm are proposed for the MCL thresholds. The report rejected considering muscle tone effect in the MCL threshold because the muscle tone has already been considered in the Flex-PLI knee joint stiffness. The report states that the high bumper effect should be considered in the MCL threshold in an appropriate, weighted manner.
- The chairperson stated, "We did not account for the muscle tone effect in the Flex-PLI knee stiffness. Therefore, it seems appropriate to consider it in the MCL threshold."
- The Zander stated, "If the muscles tone effect was not considered in the Flex-PLI knee joint stiffness, it is acceptable to consider it in the MCL threshold."
- The chairperson stated, "I do not believe there are any concerns about the ACL and PCL thresholds of 12.7mm proposed by Zander (BAST) for monitoring purposes only. The JAMA proposal for the tibia threshold, 318Nm, is also acceptable."
- ACEA stated, "We would like to review all of these values in detail because this is the first time we have heard these proposals."
- After the discussions, Flex-TEG members decided to continue this discussion until the next TEG meeting.

Action-037

- **Flex-TEG members shall continue to discuss the thresholds for the Flex-PLI until the next TEG meeting.**

8. Discussions: Evaluation Test Schedule for the Flex-GTR-prototype

8.1. Evaluation Test Schedule for the Flex-GTR-prototype, JAMA proposal (TEG-079)

- Mr. Imaizumi gave a report on the JAMA proposed evaluation test schedule for the Flex-GTR prototypes (TEG-079).
- ACEA stated, "The proposed evaluation test schedule is very challenging and very tight."
- The chairperson stated, "I agree that the test schedule is very challenging. However, we would like to keep the evaluation test schedule as it is."
- After discussion, it was decided that each organization related to the evaluation tests will take the test schedule back to their organization and check whether it is possible to keep the test schedule or not.

Action-038

- Each organization related to the evaluation tests will take the JAMA proposed test schedule back to their organizations and check whether it is possible to keep the test schedule or not.

9. Discussions: DRAFT of PS-gtr (gtr 9) Phase 2 using Flex-PLI requirements

9.1. DRAFT of PS-gtr (gtr 9) Phase 2 using Flex-PLI requirement, J-MLIT

- The chairperson introduced the J-MLIT draft for PS-gtr phase 2 with Flex-PLI requirements (no distribution of the documents), to share the information with the Flex-TEG members.
- Mr. Kinsky stated, "I do not believe drafting the PS-gtr phase 2 is a TEG task. TEG members are technical experts, not draft writers. Therefore, it is difficult for them to make the PS-gtr phase 2 draft."
- After discussions, it was decided that the chairperson will confirm whether or not making the draft is a Flex-TEG task at the next GRSP meeting .

Action-039

- The chairperson will confirm whether or not making the PS-gtr Phase 2 draft is a Flex-TEG task at the next GRSP meeting.

10. Discussions: Working schedule for the Flex-TEG

10.1. Flex-TEG Working Schedule, J-MLIT proposal (TEG-080)

- The chairperson gave a report on the J-MLIT proposal for the Flex-TEG working schedule (TEG-080).
- Mr. Kinsky stated, "The proposed working schedule is very challenging."
- The chairperson answered, "I agree that the working schedule is challenging, however, we would like to keep the working schedule as it is."
- Mr. Kinsky stated, "As I said that in the agenda 9, it is better to confirm whether the PS-gtr Phase 2 draft making mentioned in the working schedule should be done by Flex-TEG members or not."
- The chairperson answered, "I will confirm that at the next GRSP meeting as we discussed in the agenda 9."

11. Future action plans

- The chairperson proposed the following future action plans.
- Each organization related to the Flex-GTR-prototype evaluation test will take the JAMA proposed evaluation

test schedule back to their organization and check whether it is possible to keep the schedule or not.

- TEG members shall continue to discuss the thresholds for the Flex-PLI until the next TEG meeting.
- The chairperson will confirm whether making the PS-gtr Phase 2 draft is a Flex-TEG task or not at the next GRSP meeting.
- The next (eighth) Flex-TEG meeting will be held in May 2009.
- Flex-TEG members agreed with the chairperson's proposals.

12. Discussion: Contents of a Flex-TEG Status report for the 44th GRSP Meeting (Dec. 2008)

- The chairperson proposed that he draft the Flex-TEG status report for the next (44th) GRSP meeting before the GRSP meeting and then finalize the report by incorporating Flex-TEG members' comments
- The Flex-TEG members agreed to the chairperson proposal.

Action-040

- **The chairperson will draft the Flex-TEG status report for the next GRSP meeting, including a summary of the 7th TEG meeting, before the GRSP meeting and then finalize the report after incorporating Flex-TEG members' comments.**

13. AOB

13.1. Flesh part sensitivities to the atmospheres (TRL and Flex), JAMA (TEG-081)

- Mr. Imaizumi gave a report on the flesh sensitivities to the atmosphere for the TRL legform impactor and Flex-PLI (TEG-081). The report explains the Flex-PLI flesh sensitivities to the atmospheres (temperature and relative humidity) are much less than those of the TRL legform impactor.
- Mr. Zander stated, "In our study (TEG-082), the flesh sensitivities to the temperature and humidity of the TRL legform impactor were not so significant as in Mr. Imaizumi's report."
- The above information was shared among Flex-TEG members.

14. Closing

- The chairperson again expressed his appreciation to the Flex-TEG members for participating in this meeting as well as to BAST for providing the conference room.
- All members were invited to the next (8th) Flex-TEG meeting.

Annex 1: Flex-TEG Working Schedule (After 7th Flex-TEG Meeting)

Latest Flex-TEG Activities (7th Flex-TEG meeting)

11. Future action plans

By the end of December, 2008

- TEG members will discuss the JAMA Proposed Test Schedule and will give their discussion results to the TEG members by end of Dec. 2008.

Preferably by the end of April, 2009

- Flex-TEG members will conduct evaluation tests with the Flex-GTR-prototypes.

- Flex-TEG members will further discuss the open issues identified above.

May, 2009

- ★ 8th Flex-TEG meeting



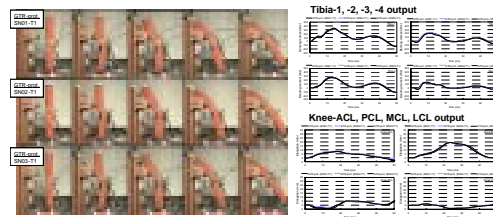
Submit status report

- ★ 45th GRSP meeting

JAMA Proposal (Test Schedule)

| Items | Promoter | 2008 | | 2009 | | | TEG |
|--|----------|------|----------|------|---------|-----|-----|
| | | Dec | Jan | Feb | Mar | Apr | |
| 1. Feasibility Study with JAMA proposed threshold values | ACEA | | | | ACEA(2) | | |
| | JAMA | | | | JAMA(1) | | |
| 2. Comparison of Flex-GT and Flex-GTR | JMLIT | | | | | | |
| | JARI | | | | | | |
| 3. Usability | ALL | | | | | | |
| | | | | | | | |
| 4. Repeatability and Reproducibility | BASi | | JMLIT(3) | | BASi(3) | | |
| | JARI | | | | | | |
| 5. A required frequency of dynamic assembly calibration test | JMLIT | | | | | | |
| | | | | | | | |

Conduct evaluation tests



Analysis on the dynamic assembly calibration tests



Annex 2: List of documents

| Document number | Document name | Dated [dd/mm/y] |
|-----------------|--|-----------------|
| TEG-001 | Agenda for 1st Meeting of Flex PLI Technical Evaluation Group.doc | 1/Sep./2005 |
| TEG-002 | Flex-G_General_Information_050904.pdf | 5/Sep./2005 |
| TEG-003 | Flex-G_Preparation_Manual_050904.pdf | 5/Sep./2005 |
| TEG-004 | 2005.09.02 - BAST Flex-G Test Programme.pdf | 2/Sep./2005 |
| TEG-005 | Revised Agenda for 1st Flex-G_MT.pdf | 6/Sep./2005 |
| TEG-006 | 2005_06_ESV_JAMA-Flex.pdf | 21/April/2005 |
| TEG-007 | 2005_06_ESV_JMLIT-Flex.pdf | 21/April/2005 |
| TEG-008 | 2005_06_ESV_NHTSA_TRL-Flex.pdf | 10/Mar./2005 |
| TEG-009 | Attendance list 1 st Flex-PLI Meeting | 6/Sep./2005 |
| TEG-010 | DRAFT Minutes 1st Flex PLI meeting_051011.pdf | 11/Oct./2005 |
| TEG-010-R1 | Modified_Minutes 1st Flex PLI meeting_051122.pdf | 22/ Nov./2005 |
| TEG-011 | Agenda for 2nd Meeting of Flex-TEG.pdf | 22/ Nov./2005 |
| TEG-011-R1 | Modified_Agenda for 2nd Meeting of Flex-TEG.pdf | 22/ Nov./2005 |
| TEG-012 | Flex-G_Minor_Modifications_onto_SN01_051122.pdf | 22/ Nov./2005 |
| TEG-013 | Flex Repeatability and Reproducibility for Thigh Leg Knee.pdf | 22/ Nov./2005 |
| TEG-014 | Flex_Assembly_Test_Results_and_Tentative_Corridors_051122.pdf | 22/ Nov./2005 |
| TEG-015 | Report_on_Flex-G_Car_Test_Results_051122_final.pdf | 22/ Nov./2005 |
| TEG-016 | Flex-TEG_Schedule_051115.pdf | 22/ Nov./2005 |
| TEG-016-R1 | Flex-TEG_Schedule_051122.pdf | 22/ Nov./2005 |
| TEG-017 | Attendance list 2nd Flex-PLI .pdf | 22/Nov./2005 |
| TEG-018 | DRAFT Minutes 2nd Flex-TEG_060228.pdf | 28/Feb./2006 |
| TEG-018-R1 | FINAL Minutes 2nd Flex-TEG_060424.pdf | 24/ April /2006 |
| TEG-019 | Draft Agenda for 3rd Meeting of Flex-TEG_060327.pdf | 24/ April /2006 |
| TEG-020 | Status Report on Action Items_060424.pdf | 24/ April /2006 |
| TEG-021 | Flex-GT-alpha_General_Information_060424.pdf | 24/ April /2006 |
| TEG-022 | Flex-GT-alpha_Injury_Assessment_Ability_060424.pdf | 24/ April /2006 |
| TEG-023 | TRL-LFI_Retry_Test_060424.pdf | 24/ April /2006 |
| TEG-024 | Flex-GT-alpha_Typical_Dynamic_Assembly_Calibration_Test_Result_060424.xls | 24/ April /2006 |
| TEG-025 | Attendance list 3rd Flex-TEG_060424.pdf | 24/April/2006 |
| TEG-026 | DRAFT Minutes 3rd Flex-TEG | 24/April/2006 |
| TEG-026-R1 | Final_Minutes_3rd_Flex-TEG_MT_070402.pdf | 2/April/2007 |
| TEG-027 | ACEA_draft_comments_Flex-GT-alpha_060530.pdf | 30/May/2006 |
| TEG-028 | Chairperson_Answer_on_the_ACEA_draft_comments_Flex-GT-alpha_060606.pdf | 6/June/2006 |
| TEG-029 | Draft_Agenda_on_4th_Flex-TEG_Meeting_070316.pdf | 16/Mar./2007 |
| TEG-029-R1 | Final_Agenda_on_4th_Flex-TEG_Meeting_070402.pdf | 2/April/2007 |
| TEG-030 | Status_Report_on_Action_Items_070402.pdf | 2/April/2007 |
| TEG-031 | Development of an FE Biofidelic Flexible Pedestrian Legform Impactor Model (FLEX-GT-prototype Model) | 16/Mar./2007 |
| TEG-032 | Development of a Biofidelic Flexible Pedestrian Legform Impactor Type GT (FLEX-GT) | 16/Mar./2007 |
| TEG-033 | Information on Flexible Pedestrian Legform Impactor Type GT (FLEX-GT) | 29/Mar./2007 |
| TEG-034 | Flexible Pedestrian Legform Impactor Type GT (FLEX-GT) Evaluation Test Results | 29/Mar./2007 |
| TEG-035 | Flexible Pedestrian Legform Impactor Type GT (FLEX-GT) Car Test Results | 29/Mar./2007 |
| TEG-036 | Flex-GT-alpha BAST/ACEA Tests | 30/Mar./2007 |
| TEG-037 | Handling and Usage (Flex-GT-alpha) | 2/April/2007 |
| TEG-038 | Certification Histories (Flex-GT-alpha) | 2/April/2007 |
| TEG-039 | ACEA Preliminary Test Results with FlexPLI-alpha | March/2007 |
| TEG-040 | Attendance list of 4 th Flex-TEG meeting | 2/April/2007 |
| TEG-041 | Draft minutes of 4 th Flex-TEG meeting | 26/July/2007 |

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| TEG-041-Rev.1 | Finalized_the_4th_Flex-TEG_Meeting_Minutes_071207 | 7/Dec./2007 |
| TEG-042 | FlexPLI Comments ACEA 20070808 TFPapproved | 12/Sep/2007 |
| TEG-043 | ACEA/BASt Joint Project Report on Tests with the Flexible Pedestrian Legform Impactors Flex GT alpha and Flex GT | 7/Nov./2007 |
| TEG-044 | 5th_Flex-TEG_Meeting_DRAFT_Agenda | 20/Nov./2007 |
| TEG-044-Rev.1 | Revised 5 th Flex-TEG Meeting DRAFT Agenda_071204 | 4/Dec./2007 |
| TEG-044-Rev.2 | Finalized 5 th Flex-TEG Meeting Agenda 071207 | 7/Dec./2007 |
| TEG-045 | J-MLIT Flex-GT Simplified Car Test Results 071129 | 29/Nov./2007 |
| TEG-045-Rev.1 | J-MLIT Flex-GT Simplified Car Test Results 080331 | 31/Mar./2008 |
| TEG-046 | JAMA-JARI Answer for the ACEA Comments Sep 2007 071129 | 29/Nov./2007 |
| TEG-047 | Flex-GT Full Calibration Test Procedures 071129 | 29/Nov./2007 |
| TEG-048 | Review of Injury Criteria and Thresholds for Flex 071129 | 29/Nov./2007 |
| TEG-049 | Evaluation of Protection Level Provided by Flex-PLI 071129 | 29/Nov./2007 |
| TEG-050 | Status of Action Items 071130 | 30/Nov./2007 |
| TEG-051 | BAST/ACEA Joint Project Preliminary Report on Flex-GT Repeatability and Reproducibility of Assembly Certification and inverse test results | 7/Dec./2007 |
| TEG-052 | FTSS Design Review of Flex-GT and FLEX-GTR Development dec14-07 | 7/Dec./2007 (14/Dec./2007 updated) |
| TEG-053 | Draft Minutes of the 5th Flex-TEG Meeting, 080124 | 24/Jan./2008 |
| TEG-053-Rev.1 | Final Minutes of the 5th Flex-TEG Meeting, 080331 | 31/Mar./2008 |
| TEG-054 | Flex-GTR_Mechanical_Design_080229 | 29/Feb./2008 |
| TEG-054-Rev.1 | Flex-GTR_Mechanical_Design_080331 | 31/Mar./2008 |
| TEG-055 | Flex-GTR_Instrumentation_Electrical_Design_080229 | 29/Feb./2008 |
| TEG-055-Rev.1 | Flex-GTR_Instrumentation_Electrical_Design_080331 | 31/Mar./2008 |
| TEG-056 | Flex-GTR_Full_Calibration_Test_Procedure_080229 | 29/Feb./2008 |
| TEG-056-Rev.1 | Flex-GTR_Full_Calibration_Test_Procedure_080331 | 31/Mar./2008 |
| TEG-057 | Flex-GTR_Optional_Instrumentation_080304 | 4/Mar./2008 |
| TEG-057-Rev.1 | Flex-GTR_Optional_Instrumentation_080327 | 27/Mar./2008 |
| TEG-058 | M=BUS_Onboard_DAS_Information_080305 | 5/Mar./2008 |
| TEG-058-Rev.1 | M=BUS_Onboard_DAS_Information_080331 | 31/Mar./2008 |
| TEG-059 | Slice_Onboard_DAS_Information_080331 | 31/Mar./2008 |
| TEG-060 | Draft_Agenda_6th_Flex-TEG_Meeting_080314 | 14/Mar./2008 |
| TEG-060-Rev.1 | Final_Agenda_6th_Flex-TEG_Meeting_080331 | 31/Mar./2008 |
| TEG-061 | Status of the Action Items_080331 | 31/Mar./2008 |
| TEG-062 | BASt Proposal for a Full Assembly Certification Test_080331 | 31/Mar./2008 |
| TEG-063 | NHTSA_Flex-GT_Test_summary_080331 | 31/Mar./2008 |
| TEG-064 | NHTSA_Flex-GT_Certification_Tests_080331 | 31/Mar./2008 |
| TEG-065 | NHTSA_Design_Upper_Body_Mass_080331 | 31/Mar./2008 |
| TEG-066 | TIPS_for_Measurement_Cable_Repairment_080331 | 31/Mar./2008 |
| TEG-067 | Repeatability_of_Dynamic_Assembly_Test_Stopper_Material_080331 | 31/Mar./2008 |
| TEG-068 | Draft Minutes of the 6th Flex-TEG Meeting | 17/Jun./2008 |
| TEG-068-Rev.1 | Finalized_Minutes_of_the_6th_Flex-TEG_Meeting_081208 | 8/Dec./2008 |
| TEG-069 | Draft_Agenda_7th_Flex-TEG_Meeting_081208 | 8/Dec./2008 |
| TEG-069-Rev.1 | Finalized_Agenda_7th_Flex-TEG_Meeting_081208 | 8/Dec./2008 |
| TEG-070 | Status_Action_Items_081208 | 8/Dec./2008 |
| TEG-070-Rev.1 | Finalized_Status_Action_Items_081208 | 8/Dec./2008 |
| TEG-071 | FTSS_Flex_GTR_prototype_Development_071208 | 8/Dec./2008 |
| TEG-071-Add.1 | Bone_Core_Durability_Improvement_081208 | 8/Dec./2008 |
| TEG-071-Add.2 | Develop_Dynamic_Assy_Calibration_Test_Methods | 8/Dec./2008 |
| TEG-072 | Japan_Flex-GTR-prototye_Evaluation_Report | 8/Dec./2008 |
| TEG-073 | MESSRING_ISO_MME_corde_Flex_Proposal | 8/Dec./2008 |
| TEG-074 | FTSS_Flex_Pendulum_Dynamic_Calbraiton_Proposal | 8/Dec./2008 |
| TEG-075 | BASt_Flex_Inverce_Dynamic_Calbration_Proposal | 8/Dec./2008 |
| TEG-076 | JAMA_Proposal_MCL_Threshod_Value | 8/Dec./2008 |
| TEG-077 | JAMA_Proposal_Tibia_Threshod_Value | 8/Dec./2008 |
| TEG-078 | BASt_Proposal_ACL-PCL-MCL_Threshod_Value | 8/Dec./2008 |

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|---------|---|---------------|
| TEG-079 | JAMA_Proposal_Flex-GTR-prot_Evaluation_Schedule | 8/Dec./2008 |
| TEG-080 | J-MLIT proposal for the Flex-TEG working schedule | 8/Dec./2008 |
| TEG-081 | JAMA_Flesh_Sensitivity_TRL_Flex | 8/Dec./2008 |
| TEG-082 | BASt_Flesh_Sensitivity_TRL | 8/Dec./2008 |
| TEG-083 | Draft Minutes of the 7th Flex-TEG Meeting | 20/April/2009 |
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http://www.unece.org/trans/main/wp29/wp29wgs/wp29grsp/pedestrian_FlexPLI.html

Annex 3: List of Actions

| Action number | Action | Dated [dd/mm/y] |
|---------------|--|---|
| ACTION-001 | The chairman will verify the representatives of the organizations that did not attend this Flex-TEG Meeting. | 06/ Sep./2005 (Reported. 2 nd TEG) Closed. |
| ACTION-002 | The chairman will obtain approval for the added tasks at the next GRSP meeting. | 06/ Sep./2005 (Reported. 2 nd and 3 rd TEG) Closed. |
| ACTION-003 | The chairman would check with Autoliv (Sweden) and Korea on their experiment contents and schedules. | 06/ Sep./2005 (Reported. 2 nd and 3 rd TEG) |
| ACTION-004 | Mr. Tanahashi to inform the group if manufacture will allow disclosure of detailed model information per test shown in ESV paper 05-0106. | 06/ Sep./2005 (Reported. 2 nd TEG) Closed. |
| ACTION-005 | The chairman would confirm the parental body of the Flex-TEG Meeting at the next GRSP and other meetings. | 06/ Sep./2005 (Reported. 2 nd and 3 rd TEG) Closed. |
| ACTION-006 | The chairman would present at the GRSP meeting a proposal for releasing Flex-TEG information material to the public through the GRSP website. | 06/Sep./2005 (Reported. 3 rd TEG) Closed. |
| ACTION-007 | The Chairman will send the properties of the materials of the pads used in the assembly dynamic calibration tests to the Flex-TEG members. | 22/Nov./2005 (Reported. 3 rd TEG) Closed. |
| ACTION-008 | The Chairman will disclose waveform data of typical assembly calibration tests (digital data) to the Flex-TEG members. | 22/ Nov./2005 (Reported. 3 rd TEG) Closed. |
| ACTION-009 | Japan: will make improvements to movable range of knee of Flex-G. | 22/ Nov./2005 (Reported. 3 rd TEG) Closed. |
| ACTION-010 | BASt/BGS: will run confirmation tests on repeatability and reproducibility of Flex-G in assembly state. | 22/Nov./2005 (Reported. 3 rd TEG) Closed. |
| ACTION-011 | Mr Imaizumi will recheck the position of JAMA members on Mr Kinsky's request to disclose the model names of test vehicles. | 24/ April /2006 (Reported. 4 th TEG) Closed. |
| ACTION-012 | Mr Imaizumi agreed to confirm if JAMA members would be willing to use TRL-LFI as well as Flex in future vehicle tests by JAMA. | 24/ April /2006 (Reported. 4 th TEG) Closed. |
| ACTION-013 | Each TEG member should review the presentation given at the current (3rd) Flex-TEG Meeting and transmit their comments to other members by the end of May 2006. | 24/ April /2006 (Reported. ACEA: 30 May 2006, Chairperson: 6 June 2006) Closed. |
| ACTION-014 | Japan should transmit the results of its future tests to TEG members at least one week prior to the coming Flex-TEG Meeting. | 24/ April /2006 (Reported. 4 th TEG) Closed. |
| ACTION-015 | The chairperson should check with HONDA if TEG members can share the human FE model and the Flex-GT FE model using for the finalization of Flex-GT specifications. | 24/ April /2006 (Reported. 4 th TEG) Closed. |
| ACTION-016 | Japan should proceed with its development of Flex-GT according to the above schedule. | 24/ April /2006 (Reported. 4 th TEG) Closed. |
| ACTION-017 | Mr Been will provide new sentences for Tasks 3 and 4 by the next Flex-TEG Meeting. | 24/April/2006 (Reported. 4 th TEG) Closed. |
| ACTION-018 | BASt/BGS shall conduct a comparison test on | 2/April/2007 |

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| | Flex-GT and the Flex-GT prototype and shall report the results to TEG members. | (Joint Project ACEA/BASt report (TEG-043) which is related on this topic is submitted to the TEG members on 7 Nov. 2007.) Closed. |
| ACTION-019 | Japan will evaluate and analyze the repeatability and reproducibility of each part of the impactor based on the measurements of the impactor itself and will report the result to TEG members. | 2/April/2007 (Japan report (TEG-034-Rev.1) which is related on this topic is submitted to the TEG members on 6 Aug. 2007.) Closed. |
| ACTION-020 | The chairperson will submit a TEG document stating the repair method when multiple measurement cables have been disconnected. | 7/December/2007 Closed. |
| ACTION-021 | The chairperson will add photos that show the deformation of the simplified car to the TEG-045. | 7/December/2007 Closed. |
| ACTION-022 | Mr. Been will propose improved calibration methods for the Flex-PLI. | 7/December/2007 Closed. |
| ACTION-023 | The chairperson will circulate a final draft of the Flex-GTR design two to four weeks before the next (6 th) Flex-TEG meeting. | 7/December/2007 Closed. |
| ACTION-024 | Mr.Kinsky will do double check the injury risk curves by their in house experts. | 7/December/2007 |
| ACTION-025 | Mr.Been will ask EEVC/ WG12 to review the current injury thresholds for FLEX-PLI. | 7/December/2007 |
| ACTION-026 | Mr.Been will make a draft proposal on EC FP7 project regarding FLEX-PLI, and then Flex-TEG member will evaluate the contents. | 7/December/2007 |
| ACTION-027 | The chairperson will make a draft Flex-TEG status report for the 42nd GRSP meeting containing a summary of this meeting by this weekend (Dec. 8, 9), and then distribute it to Flex-TEG members. | 7/December/2007 Closed. |
| ACTION-028 | Flex-GTR developer will develop actual Flex-GTR, based on the agreed Mechanical design. | 6 th Flex-TEG meeting |
| ACTION-029 | Flex-GTR developer will develop actual Flex-GTR, based on the agreed Instrumentation and Electrical Design. | 6 th Flex-TEG meeting |
| ACTION-030 | Flex-TEG member will continue to discuss the purpose of the ACL and PCL measurement values as 'for the injury evaluation' or 'for the calibration test only'. | 6 th Flex-TEG meeting |
| ACTION-031 | Flex-GTR developer will conduct actual Flex-GTR calibration tests, based on the agreed Full Calibration Test Procedure of the Flex-GTR, except the dynamic assembly calibration test procedure. | 6 th Flex-TEG meeting |
| ACTION-032 | Flex-TEG member will continue to discuss that which is better the 'pendulum style' or the 'inverse style' as for the Flex-GTR dynamic assembly calibration test procedure. | 6 th Flex-TEG meeting |
| ACTION-033 | Flex-GTR developer will prepare optional instrumentations of Flex-GTR to who required and can support the development costs. | 6 th Flex-TEG meeting |
| ACTION-034 | Flex-TEG members will act based on the future action plans which are proposed by the chairperson. | 6 th Flex-TEG meeting |
| ACTION-035 | MESSRING and DTS will draft a proposal for the ISO MME codes for the Flex-PLI measurement items and then send the proposal to the TEG | 7 th Flex-TEG meeting |

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| | members. | |
| ACTION-036 | TEG members will continue discussing which calibration test method is the better, the pendulum test or the inverse test, until the next TEG meeting. | 7 th Flex-TEG meeting |
| ACTION-037 | Flex-TEG members shall continue to discuss the thresholds for the Flex-PLI until the next TEG meeting. | 7 th Flex-TEG meeting |
| ACTION-038 | Each organization related to the evaluation tests will take the JAMA proposed test schedule back to their organizations and check whether it is possible to keep the test schedule or not. | 7 th Flex-TEG meeting |
| ACTION-039 | The chairperson will confirm whether or not making the PS-gtr Phase 2 draft is a Flex-TEG task at the next GRSP meeting. | 7 th Flex-TEG meeting |
| ACTION-040 | The chairperson will draft the Flex-TEG status report for the next GRSP meeting, including a summary of the 7th TEG meeting, before the GRSP meeting and then finalize the report after incorporating Flex-TEG members' comments. | 7 th Flex-TEG meeting |
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