

**REPORT OF THE INFORMAL EXPERT GROUP**  
about the ad-hoc meeting dealing with the development of Regulation No. 66  
(Madrid, 14-15, September 2000)

1. The informal expert group was organised on the basis of GRSG's decision (see TRANS/WP.ZS9GRSG/52, para 20) and its Madrid meeting was approved on GRSG's 78<sup>th</sup> Meeting (10-14, April 2000) The participants were:

Belgium	Ms Reyntjens, Pascale
Czech Republic	Dr Hanke Miroslav.
France	Mr. Minne Francois
Germany	Mr Becker, Michael
	Dr. Steinmetz, Gregor
Hungary	Dr. Matolcsy, Mátyás
Italy	Mr Mendogni, Giulio
Netherlands	Mr. Huibers, Jos
South-Africa	Prof. du Preez, Rudi
Spain	Prof Aparicio, Francisco.
	Mr. Sanchez, Miguel.
	Dr Garcia, Andres.

The chairman of the meeting was dr. Matolcsy M. The host of the meeting was INSIA and its director: Mr. Aparicio.

2. Before the ad-hoc meeting Hungary has circulated three documents:

- a) Draft modification of Reg.66. (Main text)
- b) Annex (X<sub>1</sub>) Determination of vehicle's CG position
- c) Annex (X<sub>3</sub>) Rollover test on complete vehicle

The basis of the modifications in these documents were those subjects in which both the expert group and GRSG agreed earlier.

3. The expert group discussed the first two documents: „a” and „b” and after modifications these are presented to GRSG for further discussion. For the time being the expert group fully agrees in the proposed texts, but the group as well as the individual experts reserve their right to modify their opinion when the further Annexes will be discussed and new information, new contexts can appear. There was no time to discuss document „c”, it remained to the next meeting of the expert group. (It is not presented yet to GRSG)

4. About the discussion of documents „a” and „b” the followings should be mentioned:

4.1. The group fully agreed on the new structure of Reg.66, which is now the same as in the other up to date regulations (see Reg.36.) All the technical requirements and specifications are in paragraph 5. (see the content of the new draft)

4.2. In spite of the scope was not the subject of the discussion, many comments, arguments were made for the revision, extension of the scope:

- for the extension to the double-deckers: Spain, South-Africa, Italy, Netherlands, Hungary
- for the extension to the midi buses (but not for the minis) Spain, South-Africa. Hungary

- Czech Republic suggested to exclude Class I. but Spain and Hungary was against that proposal
  - Hungary emphasised the problem of high-decker coaches being involved in the existing scope, but the recent rollover test (the depth of the ditch) can not qualify them.
- 4.3. Germany raises the possibility of testing the two parts of articulated buses together (and not separately as it is recently) The expert group suggested to make further study in this subject.
  - 4.4. The all expert group agreed to delete the pendulum impact test from Reg.66. therefor it is put into square bracket. But because earlier UK had reservation in this subject and there was no UK delegate on the meeting, the subject is open for further discussion. (Hungary offered a technical paper about the problems related to the pendulum test)
  - 4.5. Belgium proposed to introduce a certain „reference energy” level (starting potential energy in the rollover process) which could be a tool to evaluate the vehicle type modification, whether a new test is needed to the extension of approval, or not. The group accepted the proposal.
  - 4.6. South-Africa proposed to put some accuracy criteria of measurements into Annex [X<sub>1</sub>] and calls the group attention to the ISO Standard No. 10392/1992 (Road vehicles with two axles - Determination of centre of gravity)
  - 4.7. The expert group discussed the tilting test to determine the CG'-s height, in two respects:
    - some of the delegates expressed their experiences that the reliability of tilting test is less than that of the lifting test.
    - the majority of the group agreed that the suspension system should be blocked for the tilting test (This is also required in the ISO standard mentioned above) Spain promised to provide a paper about tilting tests without blocking the suspension system.
  - 4.8. Although the seat belt subject (the mass of belted passengers) was not discussed during this meeting, because it was not a fully agreed subject before, Spain strongly emphasised the importance of this question and urged the expert group as well as GRSG to involve the mass of seated passengers into the conditions of rollover test. Germany's opinion is that further studies are required to this subject.
5. The expert group supplemented the „List of publications dealing with the bus rollover subject.” (Informal doc. No.1. 73<sup>rd</sup> GRSG Meeting (27 - 30 Oct. 1997) See attached to this Report.
  6. Spain (Prof. Aparicio) gave a detailed accident analysis about bus accidents in Spain. Two interesting conclusions:
    - the coaches approved according to Reg.66. have 50% fatality rate in rollover accidents compared to the non approved coaches
    - further bus regulations are needed, like dynamic lateral stability, front underrun protection, passive safety of the driver.
  7. The delegate of Czech Republic circulated a paper giving an example about the documentation of computer simulation of rollover test in his country.

dr. Matolcsy Mátyás  
chairman of the expert group

SUPPLEMENT to Informal Document No.1. of the 73<sup>rd</sup> GRSG Meeting, titled  
LIST OF PUBLICATIONS DEALING WITH THE BUS ROLLOVER SUBJECT:

- BERG, F.A. - NIEWÖHNER, W. Bus safety analysis results and assessments by DEKRA accident research. Proc. of 30<sup>th</sup> Meeting of Bus and Coach Experts.. Győr, Hungary, GTE (1999) Vol.2. p.121-147.
- GARCIA, G.A. - SANCHEZ, L.M. - APARICIO, I.F. Bus rollover simulation method of INSIA used type approval. Proc. of 30<sup>th</sup> Meeting of Bus and Coach Experts. Győr, Hungary, GTE (1999) Vol.2. p.149-157.
- HANKE, M. - LACINAL, L. - PAVLATA, P. The bus rollover simulation for ECE Regulation No.66. Proc. of 30<sup>th</sup> Meeting of Bus and Coach Experts. Győr, Hungary, GTE (1999) Vol.2. p. 159-166.
- MATOLCSY, M. Development possibilities in relation to ECE Regulation 66 (Bus rollover protection) International Conference on Safety. Windsor, Canada (1998) Paper No 98-54-0-04
- MATOLCSY, M. Study of energy conditions to the rollover process of buses. FISITA Congress, Paris (1999) Paper No. F 98T649
- MATOLCSY, M. The standard rollover process of buses and the connecting problems. IAT'99 Nova Gorica, Slovenian Proc. of the Conf. IAT'99 4018 p.375-382
- MATOLCSY, M. - MOLNÁR, Cs. Bus rollover test as a process and its energy balance. Proc. of 30<sup>th</sup> Meeting of Bus and Coach Experts. Győr, Hungary, GTE (1999) Vol.2. p.167-174.
- MATOLCSY, M. Requirements for computer simulation of bus rollover test. Proc. of Int. Conf. ICrash 2000, London 2000 (Sept.) Paper No. 2109 p.35-46.
- NACENTA, J.M. - RUIZ, S. Experiences of IDIADA in rollover simulation and tests of buses. Proc. of 30<sup>th</sup> Meeting of Bus and Coach Experts. Győr, Hungary, GTE (1999) Vol.2. p
- RIEBECK, L. Simulation realitätsnaher Umsturzunfälle von Omnibussen. Nutzfahrzeuge mit tragenden Lösungen ins nächste Jahrtausend: Tagung München, 4. und 5. November 1999 (VDI Berichte 1504)