

**Draft minutes of 2<sup>nd</sup> meeting of the task Force on  
“Behaviour of M2 & M3 general construction in case of Fire Event (BMFE)”**

Date: 13 March 2018

Venue: European Commission (Brussels)

Attendance: see Annex 1

**1. Welcome and Roll call**

The chair organized a tour de table to introduce each delegate.

**2. Adoption of the agenda (BMFE-02-01e)**

The agenda was adopted with no change.

**3. Validation of the minutes of the last meeting (BMFE-01-06 Draft minutes)**

The minutes were adopted as amended (reference of the document presented by RISE as BMFE-01-05 – page 5)

**4. Actions feedbacks from previous sessions**

4.1. Outcomes of research on the time needed to break windows

The information was not yet available from RISE. There is still need for time to translate the existing Swedish document. The data will be available at the next meeting. S might table a 1-slide presentation at GRSG-114 (April 2018).

4.2. Data on the time required to escape from the vehicle

Documents:

- BMFE-02-04e (E) Report Bailen
- BMFE-02-10 (S) Real scale evacuation test in Sweden
- BMFE-02-03 (HUN)

4.2.1. Report Bailen (Spain)

E presented the document BMFE-02-04. The experts had the following comments:

- RUS: the Puisseguin accident in France faced the obstruction of an escape path by a collapsed woman. This is not a normal situation, yet could correspond to the Simulation No. 4 in the Spanish document.
- D: pointed out that the average age of the occupant in the Spanish accident and in the simulation is quite low, in particular when compared to the average age of coach occupants in e.g. D or F.

this could lead to an over optimistic outcome of the simulation.

- It is not clear in the Spanish accident whether the occupants benefited from outside help
- The more the time elapses, the less the occupants are valid enough to escape the vehicle
- In Spain, there are safety audits to evaluate the safety information given to the passengers
- D: even when there is the right amount of emergency exit in the vehicle, the occupants usually focus on the doors, in particular that was used to enter the vehicle.

The group held a debate on state of play of the regulations in UNECE vs. USA with regard to the windows as emergency exits:

- The UNECE regulation (UN R107) does not mandate the hinged windows to remain open once operated, while the FMVSS-217 does
- Seems there is a request to make FMVSS-217 evolve with regard to the automatic opening of the emergency doors, since 1999, and there is currently no practical result from the NHTSA's moves in this regard.
- In this regard, the UN regulatory framework is far ahead of that of the USA, while the amount and quality of the US researches deserve interest.
- As examples, the safety belt requirements is present in the UN regulations for about 25 years, UN R80 addresses the strength of the seats and their anchorages.

#### 4.2.2. Report Helsinborg (Sweden)

RISE document BMFE-02-10 about a parked and a moving buses that caught fire. All passengers evacuated, no injury. The Authorities then undertook 2 tests, one with 3 doors (1,25" min), one with only 2 doors (2,46" minutes). In the latter case, the evacuation time is more than twice that of the 1<sup>st</sup> case. The experts had the following comments:

- D: seems the experience show that there is a crash at the origin of the fire, while the regulations are focused on fires originating e.g. the engine compartment (crash, smoke, injured occupants).
- S: AEBS would decrease the quantity of such crashes.

The group held a debate on the "safety card" as a means to provide safety information to the passengers:

- D: information to the occupants is currently addressed by national/regional regulations: need to investigate where this is regulated:
  - o In France there are rules for dedicated places to let the instructions.
  - o Spain: national legislation
  - o The group was informed that IRU developed a "safety card" more or less universal. The question is whether the operators use it. The experts found such safety card an item primarily subject to in-use requirements (updated cards, well located, adapted to the vehicle, checked at PTI)
- RUS: clarified that there are actually 2 ways to address the certification of safety instructions:
  - o Through UN R107 (see paragraphs 7.6.11. and its sub-paragraphs)
  - o Through national regulations, i.e. for the separate cards dedicated to the vehicles.

- European Commission: the expert found that the ideal situation is when the escape path is such obvious that there is no need to educate the occupants, and that the group should tend to that situation.

#### Conclusion:

- Short basis in terms of evacuation time
- Lots of side items can affect the evacuation time: smoke, light, obstruction, information to the occupants (cannot be addressed through approval regulations).
- Data come from obsolete vehicles (approved to former versions of the regulations)
- New evaluations with dedicated scenarii could be a good confirmation of this initial status for the evacuation time.

#### 4.2.3. Existing documentation at GRSG

The group found that the document BMFE-02-03 is not of big help to the group. Yet this document shows that buses and coaches are a safe means of transport compared to e.g. the passenger cars.

RUS: In some cases, the deformation of the structure due to the tipping or roll-over is such that the emergency exit cannot open. The expert informed that this was experienced with the RUS Ecall test method, for buses and coaches, also in case of roll-over. Also, even if there is no deformation, the broken window can injure the egressing occupant. Using the test from other regulations (like ecall or UN R66) might not be relevant since these regulations do not focus on the proper criteria.

#### 4.3. Summary of conclusions coming from SDWEE IWG

The Secretariat informed the group about the outcomes of the GRSG informal group on SDWEE (Service Doors and Windows as emergency exits) on the basis of the do BMFE-02-05:

- The group investigated and introduced new provisions for the exits (i.e. doors, windows, roof hatches, special emergency exit in the rear face of the vehicle) with regard to their number, dimensions, locations.
- The group also introduced some new provisions for mandatory safety signs with regard to their harmonization, self-luminescence, positioning and location.

S questioned whether there is any existing experience with the conforming vehicles yet. However the requirements enter in application in June 2018 for new types and June 2019 for all types. One manufacturer however experienced in the UK that the Technical Service was not informed of the R107 update (pictograms vs. text). Currently some operators remove the signs that are conform to the regulation, to replace them after homologation by signs that they believe more suitable. This questions the relevancy of the work of the regulators.

In addition to this relevant feedback, the group needs to identify which not-yet-studied measures could be investigated.

#### 4.4. Data collection on accidents including fire event or escape need in the last 2 years

Documents: BMFE-02-02e and 06 (N)

BMFE-02-02: seems that the origin of the accident comes from the fact that the fuses were too high in capacity for the LED registration lamps. This led to a situation where the short-circuit could not be detected.

BMFE-02-05: Fire in a tunnel. The vehicle was occupied by middle-aged passengers. The evacuation time was approximately 2 minutes. It seems that this vehicle was approved to UN R107.

#### 4.5. Comparison on fire propagation regarding implementation orientation

Not discussed

#### 4.6. Positions from attendees according to recommendation tables (BMFE-01-03e Regulations updates synthesis)

The group reviewed the tables of BMFE-01-03 (slides 19 & 20)

The experts had preliminary comments:

- D: the expert reminded that UN R118 was recently updated and the transitional provisions are still ahead of us. He pointed out that GRSG came to the production of the 03 series of amendments after comparison with some existing standards: the burning rate and comparison with other standards should not be part of the work since this is already addressed. The chair explained that the idea of the proposal in the table is to relate the occupant egress time to the fire and smoke. The expert from D was ready to add smoke opacity and toxicity in the work of the group. RISE found it impossible to simulate the fire in a bus. The expert said that while this seems a good idea, it is not practical.
- Changing the test method is possible but is a huge amount of work.
- RUS: the expert found necessary to make COP practical, since the material has no marking. The expert from the European Commission stressed that the situation is similar to that of the steel in the vehicle: at the end of the day, the Approval Authority must rely on the certification of the steel since the platform itself is not marked. Also, such issue could be solved via proper documentation to be provided by the manufacturer.
- RUS raised the possibility of the method used at GRPE on the interior air quality.
- The chair found important to investigate the relevancy of the luggage burning, not as a fire ignition area but rather as a propagation factor.

<b>UN R118</b>		
<b>Proposals</b>	<b>Parties' opinions</b>	<b>BMFE-02 decision</b>
Reduction of combustion speed	D: already addressed in R118	Out of scope
Comparison of rail/naval/aeronautical standards	D: already addressed	Out of scope
Smoke toxicity and opacity. Comparison of rail/naval/aeronautical standards		Focus, subject to confirmation

<b>UN R107</b>		
<b>Proposals</b>	<b>Parties' opinions</b>	<b>BMFE-02 decision</b>
Smoke extraction systems like Automatic/manual opening of the roof hatches or window	F keen to investigate. As the occupants usually do not use the emergency exits (the windows) S: questioned whether the building principle can apply to the vehicle's passenger compartment. D: in case the fire is outside, the automatic opening of the windows is questionable. Also, the environment may make the egress on one side more dangerous than on the other side. S: in general, smoke evacuation is good for safety (in spite of additional side-effects)	Subject to be further investigated.
Addition of rear exit (cost/efficiency/study)		Subject to be further investigated.
Definition of minimum level for fire detection systems	S: fire detection systems must have minimum requirements since fire suppression systems add cost and weight to the vehicle.	Construct minimum requirements.
Laminated glasses in emergency exits	D: recalled the debates at GRSG, where the text was adapted such to permit the choice	Out of scope
Optimization of luminous trajectories and functionalities	Chair: finds that the current requirements can be improved. D: illumination of the emergency exit controls was one outcome of the SDWEE informal group. See R107: paragraph 7.8.1.4. The internal markings and internal controls of all exits; Chair: wants to relate this to the opacity of the smokes	Subject to be further investigated.

<b>UN R107</b>		
<b>Proposals</b>	<b>Parties' opinions</b>	<b>BMFE-02 decision</b>
Safety instructions	Instruction for passenger evacuation in case of emergency	Subject to be further investigated.
Baggage burning: introduction of an extinguishing or wall insulation system in the bunkers	D: informal group should check whether this is relevant	Focus, subject to confirmation Investigate US accident reports
Location of the fuel tank	OICA suggestion D: such proposal was discussed in the past at GRSG, then rejected. European Commission: in the Puisseguin accident, the fuel tank is located in a vulnerable place. Question: performance requirement vs. location requirement. Need to investigate to which of the fuels this must apply.	Subject to be further investigated

## 5. Definition of IWG terms of reference

Document: BMFE-02-08 (chair)

The group reviewed the terms of reference. The experts found it relevant to clarify the scopes of the regulations to be scrutinized and the associated time schedule. The group finally agreed to update the terms of reference according to the document BMFE-02-08-Rev.1

## 6. Next steps

- GRSG-114 (April 2018): expected establishment of the informal group by GRSG
- Chair to produce amended terms of reference (per document BMFE-02-08-Rev.1) and to table them at GRSG-114
- Chair to produce a summarizing report to be tabled at GRSG-114
- All to communicate their inputs and data to the chair and the Secretary based on the tables filled in during BMFE-02 (see item 4.6. above)
- 1-day meeting in May, establishing the roadmap and the targets to achieve

## 7. Next meetings

BMFE-03 to take place in Paris (OICA offices) on 29 May 2018, starting at 10:00 am, finishing at 5:00 pm. Chair precised that following sessions could be articulated on 2 days meeting, one dedicated for R107 and the other one dedicated for R118, simplifying experts interventions.

Target is to bring data along the lines of the orientation defined at BMFE-02, i.e. evacuation time vs.

smoke toxicity and opacity, minimum requirements for fire detection systems, insulation of luggage compartment, etc.) and start technical amendments to the UN R107 and 118.

**8. A.O.B.**

Not discussed