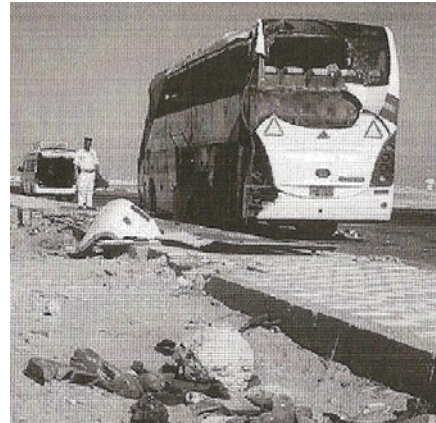


### CONCLUSIONS OF A SEVER ACCIDENT

1. Similar paper was presented by Hungary (based on the same accident shown below) on the SDWEE meeting in Bonn, November 2011. Under the time pressure – the expert group wanted to finish its proposal to GRSG – there was no way for detailed discussion. Therefore Hungary comes back to this problem on GRSG level, proposing it for consideration.
2. On 06. 11. 2011. a sever bus accident happened in Egypt, a HD coach rolled over with 50 Hungarian tourists on board. The coach – taking a curve with relatively high speed – turned on its left side, slid 30-50 m and stopped. The result: 11 fatalities, 29 injured and hospitalized passenger, among which 4 were in life danger and 15 seriously injured.
3. The superstructure was strong enough, no significant structural deformation. The casualties were caused by ejection of the passengers, mainly by partial ejection. This was said by the doctors and by the surviving passengers. All the side windows were broken, the outside panel of the side wall and the ground was covered with blood. The surviving passengers said that all passengers fell onto the left side of the bus, compressing the people sitting next to the window to the window and to the road surface and they were rased and ground by the broken glass fragments and by the ground. (see the bloodstains on the side wall panels and on the ground)





4. The fire brigade and the ambulance people were on the scene in 20 minutes. The firemen rescue the passengers through the windscreen and the rear wall window. Escape hatches were not mentioned and from the pictures it is difficult to estimate the number and the position of this kind of emergency exit (see the long AC device on the roof). But it is clear that these injured passengers could not evacuate the bus even with the powerful help of the firemen, through the escape hatches
5. This accident was the headline in the Hungarian newspapers and the TV news in one week. Everybody gave wiser and wiser advice to anybody, who is “responsible” for this tragedy. The society was shocked by this accident.
6. There is no final report about the accident, and it is not sure whether we shall get it from Egypt, mainly which is usable in technical and medical respect. But this accident underlines certain conclusions:
  - 6.1. if the superstructure is strong enough, there are no significant, large scale structural deformations, so the survival space remains intact, the most dangerous injury mechanism: the intrusion and compression is avoided.
  - 6.2. but there is no solution for the second most dangerous injury mechanism: ejection of passengers (both total and partial ejection shall be considered)
  - 6.3. many times the different injury mechanisms (projection, ejection, gash and prick, etc.) are related, but there is no one – only one – solution which is effective against all of them.
7. To eliminate the injuries related to the ejection is more complex task than to do that in case of intrusion/compression. A lot of subjects shall be studied and considered, e.g.
  - the use of laminated glazing in side windows
  - to reconsider the necessity of side window as emergency exit and the usability of breakable side window as emergency exit
  - to study the effectiveness of the safety belts in rollover
  - to consider all the possible injury mechanisms together in rollover
8. Hungary is planning to provide two documents to GRSG on its October session:
  - Proposal to modify the SWDEE proposal in relation to the breakable side windows as emergency exit
  - Information and questions about the effect of safety belt in rollover

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