

## STATISTICS ABOUT ROLLOVER ACCIDENT OF BUSES – VI

(Transmitted by the expert from Hungary)

1. This is the 6<sup>th</sup> statistics in the line:
  - I. 78<sup>th</sup> GRSG meeting, April 2000, informal doc. No.6
  - II. 80<sup>th</sup> GRSG meeting, April 2001, informal doc. No.5
  - III. 83<sup>rd</sup> GRSG meeting, October 2002, informal doc. No.7
  - IV. 84<sup>th</sup> GRSG meeting, May 2003, informal doc. No.4
  - V. 85<sup>th</sup> GRSG meeting, October 2003, informal doc.No.1/Rev.1.
  
2. The unusual way of collecting accident statistics – using the reports, information of the media – has been described in the earlier documents listed above. In the Annex of this document 65 new rollover bus accidents have been collected from the last 12 months, which means that altogether there are 222 rollover bus accidents, from which some interesting tendencies, conclusions, information may be read out. Table I. gives a summary of the six statistics, containing all the 222 accidents.

Table 1.

Summary of rollover statistics	Statistics I-III. 1990-31.07.2002	Statistics IV 01.08.2002-31.12.2002	Statistics V 01.01.2003-31.08.2003	Statistics VI. 01.09.2003-01.09.2004	Σ (I–VI.)
Number of accidents	97	20	40	65	222
Number of countries involved <sup>(1)</sup>	min.37	min.14	min.22	min.30	min.56
Total number of					
- fatalities	1011	170	534	841	2556
- serious injuries	304	112	112	156	684
- light injuries	415	47	59	164	685
- injuries without classification	508	160	360	672	1700
- reported “many injuries”	9 times	1 time	5 times	2 times	17 times
Type of rollover (severity)					
- turned on side	11	5	4	20	40
- rollover from the road <sup>(2)</sup>	43	7	16	20	87
- serious rollover <sup>(3)</sup>	18	3	12	17	80
- combined accident <sup>(4)</sup>	25	5	8	7	45
Category of the bus rolled over					
- C I. (city, suburban)	6	-	1	-	7
- C II (intercity, local)	9	-	4	5	10
- C III (tourist, long-distance)	48	9	14	19	90
- Double decker	5	-	3	3	11
- Small bus <sup>(7)</sup>	11	8	11	16	46
- School bus	3	-	2	1	6
- Other (worker, pilgrim, etc.)	5	-	-	2	7
- unknown	13	3	5	19	40
Deformation of superstructure					
- serious deformation <sup>(5)</sup>	15	9	7	12	43
- slight deformation <sup>(6)</sup>	21	7	6	18	52
- no information	61	4	27	35	127

Table I. needs some explanations which follow below (The reference numbers are used in Table I. as well):

- (1) countries may be involved as manufacturer, approval authority, operator or the scene of the accident.
- (2) not too severe accident, but more than turning on side (1/4 rotation): roll down into a ditch, down on a slope (not more than 2 rotation) turned down from an overbridge of a highway (the level difference between the start and end position less than 8 m)
- (3) more than two rotation, more than 8 m level difference in the rollover or falling down
- (4) the combined accident means e.g. rollover after a serious frontal collision, rollover with fire, falling into water after rollover, etc.
- (5) serious deformation means the damage of the survival space, (the collapse of the superstructure obviously belongs to this category).
- (6) slight deformation means that the survival space very likely is not damaged in the rollover accident.
- (7) in the reports this category is called: minibus, microbus, small bus, club bus, ambulance bus, etc. without exact specification

### 3. Worldwide situation of the bus rollover accidents.

This new method collects worldwide statistics but this statistics is projected by the Hungarian media (It means that from the far countries only the very serious accidents are reported) Table 2. gives the yearly distribution of the collected accidents. It is interesting to mention that the real collection of the data started in 1999 but this was not a complete year. The intensity of the collection was increased during the years. The small buses, mini buses were out of interest before 2001. So the yearly increasing number of bus rollovers does not cover a real tendency in this kind of accidents, but it shows the result of a more precise and intensive observation of the media (More newspapers, TV and radio channels are involved) The number of the registered buses in Hungary is around 19 thousand. This fleet produces 12-15 rollover accidents per year. (Independently from the casualties) The complete European bus fleet could be in the range of 500-550 thousand units. Using the Hungarian proportion the expected number of bus rollover accidents in Europe could be in the range of 310-430/year. It is interesting to mention that in Spain 33 rollover accidents were reported [1] between 1984-88 and 20 in the years 1991-92 [2] This figures involves only the tourist coach accidents in which passengers died. (At least one)

Table 2.

	1990-1998	1999	2000	2001	2002	2003	2004*	Total
Hungary	4	2	4	13	12	14	16	65
Europe (excl. H.)	13	8	7	6	8	14	6	62
Other than Europe	4	7	7	12	19	28	18	95
Total	21	17	18	31	39	56	40	222

\* only the first 8 months from the total year

The world wide statistics means that at least 56 countries are involved anyhow (see Table 1. and belonging remarks) The scene of the accident is known in every case (100%) but the manufacturer, operator and the approval authority (if any) in less cases, as Table 3. shows.

Table 3.

Known from the statistics (as country)	Number	%
Scene	222	100
Operator	158	71
Manufacturer	64	29
Approval authority	17*	8

\* only Hungarian buses

It is interesting to have a glance on Table 4., in which those countries are listed which are frequently involved in the rollover statistics.

Table 4.

Country	As the scene of the rollover	As bus operator	As bus manufacturer	Total
Hungary	65	48	18	131
Germany	6	8	33	47
China	13	11	-	24
Austria	14	3	-	17
Spain	5	3	1	9
Egypt	5	4	-	9
France	8	1	-	9
India	5	4	-	9
Greece	4	4	-	8

Brief comments to the figures:

- Hungary – the statistics is based on the Hungarian media
- Germany – strong bus industry, German buses operating everywhere
- China – huge country, many serious rollover
- Austria – hilly roads

#### 4. The severity of the rollover accident

It is an essential issue when determining the standard approval test, this expresses the demand of the public opinion: in which kind of accident situations should be the passengers protected, the survival possibility assured. The number of the different kind of rollover accidents – based on their virtual severity – in the whole statistics is shown in Table 1. It seems to be acceptable to say that the first two accident type, the “turn on side” and, “rollover from the road” accident categories should be covered by the standard rollover test, by the approval. That means, in these kind of accidents the occupants should be protected, the survival space should be intact (“protected accidents”) In this statistics 127 accidents (57% of the total) belong to these two categories.

It must not be forgot that the rate of the severity in this statistics depends on the locality of the accident, or in other words: this rate strongly deformed. E.g. a “turn on side” of a minibus without fatalities is reported only if it happened in Hungary, but it is not a news for the Hungarian media if it happened in Brasilia or China. This is proved by Table 5. The conclusion of this effect is that the more severe rollover accidents are over-represented in this accident statistics considering the whole world, or in other words the “protected accidents” cover at least 70-75% of the total bus rollover accidents around the world as it is shown in Table 6. Table 7. shows that the half of the injuries (53%) are “produced” by these two accident types and their fatality rate is also exceeding the 30%.

Table 5.

	Turned on side	Rollover from the road	Combined rollover	Serious rollover	Total
Hungary	30 (46%)	30 (46%)	5 (8%)	-	65 (100%)
Europe (excl. H.)	9 (5%)	29 (47%)	13 (20%)	11 (18%)	62 (100%)
Other than Europe	1 (1%)	28 (33%)	26 (30%)	40 (47%)	95 (100%)
Total	40	87	44	51	222

Table 6.

	All rollover accidents	Protected accidents	
		number	%
Hungary	65	60	92%
Europe (exl.H.)	62	38	61%
Other than Europe	95	29	30%
Total	222	127	57%

#### 5. To control the standard approval test used in ECE Regulation 66.

It is difficult to check, whether the recently used approval test is adequate to separate the strong superstructure from the weak one, to meet the demand of the public, to assure the required safety for the

passengers at least in the “protected” rollover accidents. A slow feedback can be found from this accident statistics, even if this statistics does not give direct information about the efficiency of the approval of buses regarding ECE-Reg.66. But indirectly an interesting comparison may be done. As it was defined above, “protected rollover” accidents cover those accidents in which the passengers should be protected, the survival space shall be maintained. Among the 222 rollover accidents there are 95 in which we have information about the behaviour of the superstructure: 52 accidents did not cause damage in the survival space and in 43 accidents the survival space was harmed, including the total collapse, too. The casualties belonging to these groups are shown in Table 7.

Table 7.

Injury categories	“Protected” rollover accidents	Accidents in which the survival space	
		unharmed	damaged
Fatalities	799	43	565
Serious injuries	365	82	272
Light injuries	487	227	190
Injuries without classification	766	237	422
Reported “more injuries”	6 times	2 times	1 time
Number of accidents	127	52	43

The interesting comparison is shown in Table 8. in which the casualty rates of four kinds of rollover accidents are compared. The fatality rate is 16 times, the serious injury rate 4 times higher when the survival space was damaged compared to the intact survival space. From this recognition it comes the clear goal of the international regulation: in the protected accidents the survival space shall be maintained. It is interesting to mention on the basis of Table 8. that the number of the light injuries are not closely related to the type or category of the accident. It may be assumed that this type of injuries are caused mainly by the inside collision of the passengers when they are leaving their seats, seating position during the rollover process. The main tool to reduce this kind of injuries could be the use of seat belts. (It has to be emphasized that the seat belt can reduce the number of fatalities and serious injuries, too, and also the ejection of the passengers.)

Table 8.

Considered accidents	Number of events	Casualty per accident			
		fatality	Serious injury	Light injury	Injury without classification
All rollover accidents	222	11,5	3,1	3,1	7,6
“Protected” rollover accidents	127	6,3	2,9	3,8	6,0
Survival space unharmed	52	0,8	1,6	4,4	4,6
Survival space damaged	43	13,1	6,3	4,4	9,8

## 6. The high decker (HD) and double decker (DD) coaches

These vehicles became very popular in category 3 (long distance and tourist coaches) in the last decade, their ratio in this category is increasing, mainly in the developed countries. Table 1. shows that 45% of the buses having rollover accident belong to Category 3. (101 accidents) including the double decker coaches (DD) too. The HD and DD coaches are really tourist and long distance coaches, independently from the fact that they are covered by two different general safety regulations (Reg.36. and Reg.107) Table 9. shows that 38 coaches were HD and DD among the rollover accidents (38% of the coaches) In 32 cases there was no information about the construction of the coach, so some of them might be as well HD or DD. It means that 40% or more is an acceptable estimation for the representation of the high coaches (HD and DD) in the rollover accident of the long distance and tourist coaches. In other words: they are over-represented in the rollover statistics compared to their rate in the total population of long distance and tourist coaches around the world. Two important technical problems are connected to the high coaches:

- the dynamic lateral stability of these high vehicles is not sufficient, it should be increased and regulated,
- because of the geometrically limited structural deformation, caused by the given geometry of the rollover test (800 mm depth of the ditch) the existing standard approval test is not appropriate for

HD coaches to separate the weak superstructure from the strong one [3] and for the DD coaches there is no regulation for the strength of the superstructure.

Table 9.

Conclusion of coaches having rollover accidents	Number	%
Traditional (total height 3-3,2 m)	22	22%
Probably traditional	9	9%
HD (total height more than 3,4 m)	27	27%
DD (double decker coaches)	11	11%
Non information about construction	32	31%
Total	101	100%

## 7. The rollover problem of the small buses

This question has been neglected in the past. For the question “Why?” there are some possible explanations, e.g.:

- small bus, smaller passenger capacity, lower casualty figures in a rollover accident, lower public interest,
- no statistical data about the rollover accidents of small buses,
- the small buses (ECE-Reg.52) are not covered by ECE-Reg.66 requiring the strength of bus superstructure in case of rollover.

In this unusual bus rollover statistics we started to collect the information about the small buses, too. Unfortunately not at the beginning of the work, for years they were out of interest. These accidents are collected only in the last 3 years. The first problem was – and still it is – that in the everyday language (in the news) different words are used: minibus, microbus, small bus, club bus, etc. without any technical background. ECE-Reg.52 has a clear specification: in the small bus the passenger capacity should not exceed 22. But in the everyday practice that covers rather different vehicles As Table 1. shows: altogether 46 rollover accidents have been recorded. Table 10. gives the casualties in these accidents. It has to be mentioned that in two reports there was nothing about casualties, the accidents were mentioned in the radio as the reason of heavy traffic jam.

Considering that the passenger capacity of the small buses (10-20 passengers) is roughly one forth compared to the big coaches (40-70 passengers). Comparing the figures of casualty per accident given in Table 8. and Table 10. it may be said that the casualty risk of the passengers in small buses is in the same order as in large buses.

This is the first announcement in this subject, further investigations are needed (the population of small buses, the characteristic types and categories of small buses, their structural deformations in rollover accidents, the rollover process of this category, etc.)

Table 10.

Casualties in rollover of small buses (30 accidents)	Number	Casualty per accident
Fatality	160	3,5
Serious injury	72	1,6
Light injury	84	1,8
Injury without specification	65	1,4
Report “some injuries”	once	-

It is interesting to mention that frequent reason of the rollover of small buses is a side collision with a car or other vehicle. It happened 14 times among the 46 rollover accidents.

## 8. Some further interesting information

### 8.1. Ejection of occupants

The attention was called in the very beginning of the studies to the fact that the *ejection* could be very dangerous situation for the passengers in a rollover accident. This new type of accident statistics showed

and analysed here is not detailed enough to get reliable information about this problem. But it has to be mentioned that there were 9 reports in which the ejection of one or more passengers were mentioned, emphasizing that they were killed (pressed) by the bus. It proves that this is an existing problem. There are different possibilities, tools to reduce the risk of the ejection, e.g. safety belt, laminated safety glazing of side windows, horizontal rail (hand strap) at the side windows (at the shoulder of the seating passengers) etc.

### **8.2. Fire in rollover accident**

There were 7 rollover accidents in which the bus took fire and burned out completely. These are very severe accidents, listed among the “combined rollover”.

### **8.3. Hauling trailer by the bus**

In this last statistics an interesting phenomenon appeared: two coaches hauling trailer rolled over and both coaches it was supposed that the trailer contributed to the accident.

### **8.4. Effect of the driving speed on the deformation mechanism**

It is strongly discussed since the beginning of the study of bus rollover process that the driving speed of the bus could strongly influence the deformation mechanism of the superstructure. In 99 rollover accidents (among the 222 ones) there were acceptable information (photos, video reports) about the superstructures, about their deformations. There was no one, in which the effect of the driving speed (longitudinal components of the impact force) could be observed. Only the well know 4-5-6 plastic hinge mechanisms worked according to the lateral component of the impact force acting between the ground and the cantrail of the bus.

### **8.5. Effect of the circumstances on the rollover process.**

There are different ways of the rollover, different reasons initiating the process. But the severity of the accident depends on the circumstances, the scene of the rollover (flat road, deep ditch, slope with considerable level difference, deep valley or precipice next to the road, etc.) The stronger superstructure the more safety for the bus occupants in any circumstances.

### Bus rollover accidents collected between 01.09.2003 – 1.09.2004

Annex

	Date City (district) Country	Bus type Category Operator	Circumstances of rollover	Fatalities and injuries	Damage of superstructure
1.	02.05.2003 Pulma, Kasmir India	Local operator	The bus slipped on the road and rolled down into a precipice	15 fatalities 25 injuries	
2.	03.05.2003 Arles France	Small bus Rumanian op.	The bus hit a car, broke through the barrier and rolled over twice, stopped on its roof	4 serious injuries 12 injuries	
3.	21.05.2003 Peru	Local operator	Mountain road, the driver fell asleep and the bus left the road and rolled down on a slope	14 fatalities 45 injuries	
4.	24.08.2003 Weissenfels, A4 Germany	SETRA Toursit HD coach	The bus slipped on a highway, twirled and rolled down on the slope of the highway	5 fatalities 17 injuries	The right side windows and the right half of the windscreen were broken, slight deformation of the superstructure, but survival space unharmed
5.	24.08.2003 Jenen China		A tanker pushed down the bus from the road which rolled into a precipice	27 fatalities	
6.	25.08.2003 Portaux-Princ Haiti		The driver lost the control, the bus left the road and rolled into a precipice	23 fatalities 15 injuries	
7.	31.08.2003 Kerekegyháza Hungary	IKARUS 256 Intereity, 11m Local operator	The bus tried to avoid a collision with a tanker, but after a small collision it left the road, tried to come back, but finally turned on its right side	4 serious injuries 16 light injuries	The right side windows and the right half of the windscreen were broken, slight deformation of the superstructure but the survival space unharmed, no deformation on the front wall
8.	15.09.2003 Nepal		The bus left the road and rolled down into a 80 m deep precipice	43 fatalities 19 injuries	
9.	18.09.2003 Turkish Iranian border Turkey	Tourist coach Iranian operator	Iranian pilgrims were on board. The brake failed, the bus was accelerated on the mountain road, slipped and rolled down into a precipice	13 fatalities 26 injuries	
10.	25.09.2003 Budapest Hungary	VW Microbus Hungarian operator	A car hit the microbus on its side, the bus turned on its left side, slipped and stopped.	2 injuries	No significant damage, the survival space unharmed
11.	29.09.2003 Platamona Greece	NEOPLAN DD coach, 3 axles Hungarian operator	A car passed a truck, the bus tried to avoid the frontal collision and drew aside but the driver lost the control. The bus turned crosswise on the road and rolled on its right side, slipped away and stopped - 32 folk dancer on board, they left the bus through the escape hatches and broken windscreen	4 serious injuries 19 light injuries	Slight deformation on the upper part of the superstructure, but the survival space was unharmed
12.	01.10.2003 Bergville	Small bus	English tourist group on board. The driver tried to avoid a pedestrian, the bus slipped and rolled over	8 fatalities 4 injuries	

	South Africa	Local operator					
13.	16.10.2003 Győr Hungary	Microbus Hungarian operator	The bus collided a car and turned on its right side. The bus was empty, the driver died because of the frontal collision	1 fatality	Considerable deformation of the superstructure		
14.	21.10.2003 South-Korea	Tourist coach Local operator	31 persons on board. Hilly road, the driver lost the control, the bus rolled over	16 fatalities 15 injuries			
15.	27.10.2003 Hungada Egypt	Tourist coach Local operator	63 Polish tourist on board. The driver did not realise a detour sign, run into a road reconstruction site, one of the front wheel into a hole, rolled over with 1,5 rotation, stopped on its roof.	7 fatalities 26 injuries	The superstructure collapsed, no survival space remained.		
16.	28.10.2003 Turkey		The bus rolled down into a precipice	10 fatalities 20 injuries			
17.	11.11.2003 Budapest Hungary	IVECO Small school bus Hungarian operator	22 children on board. The bus was hit by a van and therefore turned on its side.	10 light injuries	No considerable deformation on the superstructure		
18.	13.12.2003 Kaposvár Hungary	Microbus Local operator	The microbus transported children. On the slippery road the driver lost the control, the bus rolled into the ditch, laid on its side.	3 serious injuries 2 light injuries			
19.	17.12.2003 Diamantina Brasilia	Long-distance coach Local operator	In a sharp curve the driver lost the control (high speed!) the bus left the road rolled down into a 40 m deep valley. The two drivers survived, but seriously injured	22 fatalities 43 serious injuries	The superstructure completely collapsed and disappeared.		
20.	30.11.2003 close to Kuwait, Iraq	Pilgrim bus Kuwait operator	The circumstances are unknown, the bus rolled over on a flat road	17 fatalities 33 injuries			
21.	02.12.2003 Himachel Prades India	Local operator	The bus was overcrowded, the mountain road was icy. It slipped down from the road and rolled down into a 100 m deep valley and fell into an icy river. The driver survived but seriously injured.	31 fatalities 33 injuries			
22.	07.12.2003 Kasmir India	Local operator	The bus rolled over and fell into a precipice.	23 fatalities 15 injuries			
23.	07.12.2003 Concepcion de Oro Mexico	Local operator	The bus left the road and rolled over and fell into a 300 m deep valley	15 fatalities 15 injuries			
24.	18.12.2003 Simferopol Ukraine	Tourist coach Local operator	On a hilly road, early morning the driver lost the control, the bus left the road and rolled into a deep ditch	16 fatalities 16 serious injuries			
25.	07.01.2004 Fehérvárcsurgó Hungary	Ford Transit Ambulance microbus Hungarian operator	The microbus slipped and turned crosswise on the road, it was hit by another small bus coming from the other direction. It rolled over and stopped on its side. The driver seriously injured	2 fatalities 2 serious injuries	One side of the bus was damaged by the collision and the superstructure slightly deformed, but the survival space remained unharmed.		
26.	07.01.2004	Mercedes	On the icy road the driver lost the control, the bus		The superstructure slightly deformed, the driver		

	Városföld Hungary	Microbus Local operator	started to slip and turned into ditch, laying on its side. The bus was empty.	1 injury	could not open the doors, could not leave the bus. Firemen helped him.
27.	09.01.2004 Bhakkar Pakistan	Intercity Local operator	The bus was overloaded, the front axle was broken and became uncontrolled and rolled over into a channel next to the road. Only those people survived who travelled on the roof of the bus.	62 fatalities	
28.	01.01.2004 Bergville South-Africa	Small bus Local operator	The driver tried to avoid hitting a pedestrian, the bus slipped and rolled over because of the sudden steering manoeuvre.	8 fatalities 4 injuries (British tourist)	
29.	24.01.2004 Örkény (M5) Hungary	SETRA (9 m) Tourist coach, HD Bulgarian operator	Early morning the driver fell asleep, the bus rolled into the 1 m deep ditch, slipped 40-50 m and stopped on its door side. 21 persons on board travelling from Bulgaria to Poland	2 fatalities 4 serious injuries 9 light injuries	The superstructure seriously damaged, many passengers could come out only with the help of the firemen, after some hours.
30.	26.01.2004	Local operator	The bus rolled over with a festive party on board	24 fatalities 50 injuries	
31.	China (south) 27.01.2004 Chalus Iran	Iranian operator	The driver tried to avoid a frontal collision, but lost the control and the bus run through the barrier, left the road and rolled down into a 150 m deep precipice and stopped in a river	11 fatalities	
32.	12.02.2004 Székesfehérvár Hungary	IKARUS 256 Intercity (11 m) Hungarian operator	The driver tried to avoid a collision with a truck, because of the sudden steering the bus slipped into a 2,5-3 m deep ditch and turned on its door side. 40 persons on board, they left the bus through the emergency windows	2 serious injuries 10 light injuries	The survival space remained intact, only small deformations and the superstructure
33.	21.02.2004 Bano Brazil (north)	Brazil operator	40 passengers on board, at early dawn the bus left the road and rolled into a water reservoir. Nobody could come out from the bus	41 fatalities	
34.	08.03.2004 Veszprém Hungary	Microbus Local operator	Icy road, the bus rolled into a ditch.	3 serious injury	The survival space was not harmed
35.	19.03.2004 Győr Hungary	Small bus Hungarian operator	The bus collided a truck and turned on its left side	1 fatalities 2 serious injury 4 light injuries	Only the front wall damaged seriously
36.	25.03.2004 Pomóapáti Hungary	Mercedes Small ambulance bus, local operator	The driver lost the control, the bus turned on its side and slipped into a small ditch	3 light injuries	No damage of the superstructure
37.	27.03.2004		The bus rolled down into a precipice, 60 passengers on board	30 fatalities 30 injuries	
38.	Ethiopia 05.04.2004 Priepolje Serbia	Tourist coach Bulgarian operator	48 student on board, coming home from Dubrovnik to Bulgaria. Serpentine road, burst on the front tyre, the driver lost the control, the bus rolled down 40 m into a	12 fatalities 36 injuries	

39.	05.04.2004. Lébény (M1) Hungary	Mercedes Small bus Ukrainian operator	river. Early morning, the bus left the lane, hit the rail grad, turned on its side, slipped away 30 m and finally stopped in a ditch. The driver was ejected and died.	1 fatality (driver) 1 serious injury 7 light injuries	
40.	18.04.2004. Mity-Mory France	Tourist coach HD French operator	Moistly, slippery road. Two drivers and 34 American tourists on board. The driver lost the control, the bus rolled into a ditch.	1 fatality 3 serious injury 8 light injuries	
41.	23.04.2004. Gyöngyös (M3) Hungary	Mercedes Tourist coach Hungarian operator	40 retired people on board. The bus drove on the highway, the driver lost the control on the curved take-off road, the bus rolled into a 1 m deep ditch, stopped on its door side.	4 serious injuries 11 light injuries	No significant deformation on the superstructure. Right side of the windshield was broken where the passengers left the bus
42.	04.05.2004. Ain-Harrunda Morocco	Intercity bus Local operator	Slippery road, high speed, the driver lost the control, the bus rolled over	17 fatalities 22 injuries	
43.	10.05.2004. Ócsa Hungary	Mercedes Small bus Hungarian operator	In a curve the bus drifted into the other line, hit a truck and turned on its side and slipped away 10 m.	2 fatalities 1 serious injury 3 light injury	The superstructure seriously damaged and also the front wall.
44.	08.06.2004. India (east)	Local operator	32 people, wedding guests on the board. The bus left the road and rolled down in the river Bagmati.	25 fatalities	
45.	14.06.2004. Tantung China (north)	Local operator	31 people on the board. The driver lost the control, the bus rolled over	17 fatalities many injuries	
46.	16.06.2004. Islamabad Pakistan	Small bus Local operator	The overloaded bus collided a truck on a bridge, run through the barrier and rolled down into a river bed (no water in it) 8 m level distance	40 fatalities 10 injuries	The superstructure completely collapsed, the seats were compressed by the roof.
47.	06.06.2004. Peshavor Pakistan	Pilgrim bus Local operator	The bus rolled down into a precipice	40 fatalities	
48.	16.06.2004. Katmandu Nepal		Overloaded bus, serpentine road. The bus slipped on the road, rolled down on a 100 m long steep slope	24 fatalities 21 injuries	The superstructure disappeared.
49.	22.06.2004. Poitiers France	IRIZAR Tourist coach HD Moroccan operator	48 passenger on board, travelling from Belgium back to Morocco. The bus hauled a trailer. Strong wind, high speed, the trailer started to oscillate, the bus slipped, run through the rail guard and rolled down on a slope (8 m level difference)	12 fatalities 12 serious injuries 14 injuries	The rear part of the superstructure collapsed, the front part withstood, the windshield was not broken, only cracked
50.	23.06.2004. 400 km from La Paz, Bolivia	Local operator	The bus left the road and fell into a 200 m deep precipice. 6 passengers survived.	38 fatalities	
51.	30.06.2004. Netanjan Israel	Tourist coach HD Local operator	Children on the board, the bus had a frontal collision with a truck, the bus turned on its side, got fire and burned out. The children were evacuated in time, nobody was burnt	3 fatalities 47 injuries	No serious damage of the superstructure the survival space remained intact
52.	13.07.2004.	IKARUS 256	The bus drifted on the soft sideways and rolled down		No damage on the superstructure

	Budapest Hungary	Intercity bus Hungarian operator	into the ditch, stopped on its door side. The 27 passenger were evacuated by the firemen	No injury	
53.	18.07.2004. Köln Germany	Tourist coach DD Danish operator	The bus rolled down from the road on a slope (level difference 6-7 m) having a special vertical final position	2 fatalities 24 serious injuries 32 light injuries	The upper deck was strongly damaged, mainly the door side
54.	25.07.2004. Lébény (M1) Hungary	BOVA Tourist coach HD Roman operator	40 tourist travelled to France from Romania. Early morning the bus left the highway and rolled into a 0,5 m deep ditch, stopped on its door side. The bus hauled a trailer. The driver fell asleep.	7 serious injuries 19 light injuries	Small deformation of the superstructure, mainly on the door side, but the survival space remained intact
55.	19.07.2004. Laximpur India	Local operator	50 passengers on board, high speed, the driver lost the control, the bus rolled down into a ditch.	40 fatalities 10 serious injuries	The superstructure completely collapsed
56.	08. 01. 2004. Tatabánya M1 Hungary	Small bus Bulgarian operator	The bus slipped on the icy road, hit the safety bar and rolled over. The driver was ejected.	1 fatality (driver) no injury	The essentially superstructure did not damaged
57.	30.07.2004. Tarcan Turkey	Tourist coach Local operator	The bus had a frontal collision with a truck and after that it rolled over and slipped on its side. The bus driver died	25 fatalities 30 injuries	The front wall and the whole superstructure was seriously damaged
58.	02.08.2004. Huaraz Peru	Local operator	Because of a technical fault, the bus left the road and rolled down into a precipice	30 fatalities 15 injuries	
59,	02.08.2004. Budapest Hungary	Mercedes 313 Microbus, ambulance Hungarian operator	A car hit the bus on its side, the bus rolled over and slipped away 10 meters	2 serious injuries	No considerable structural deformation on the superstructure
60.	14.08.2004, Carolina Salvador	Tourist coach Local operator	The bus left the road and rolled down into a precipice	35 fatalities many serious injuries	
61.	10.08.2004. Hallein Austria	SETRA Tourist coach HD Local operator	A small bus, making a wrong overtaking pushed the coach off the road. It rolled down on a slope, made 1,5 rotation. 48 persons on board, many passengers were ejected, the coach stopped on its roof. Firemen could bring out many passengers from the destroyed coach.	5 fatalities 43 injuries	The superstructure completely collapsed, the roof compressed the seats
62.	16.08.2004. Katmandu Nepal	Tourist coach Local operator	The driver lost the control, the bus left the road and rolled down into a river	25 fatalities	
63.	29.08.2004. Bordeaux, A63 France	Tourist coach Spanish operator	A small truck lost the freight from its platform, the bus following the truck tried evade it but turned on its side and slipped away. Some cars run into the lying bus.	8 fatalities 9 serious injuries 30 injuries	
64.	28.08.2004. Karcag, M4 Hungary	NEOPLAN Tourist coach, DD German operator	A heavy truck shoved the bus from the road which rolled into a channel. Some passengers were taken out from the bus by the firemen	2 injuries	No significant deformation on the superstructure
65.	28.08.2004. Mezőkövesd, M3 Hungary	Tourist coach Ukrainian operator	The bus left the road and turned into a small ditch, stopped on its side.	2 injuries	No significant deformation on the superstructure

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