

## UNUSUAL STATISTICS ABOUT ROLLOVER ACCIDENTS OF BUSES - II.

(Produced by the Hungarian delegate of GRSG)

### 1. Remarks to the statistical data

This is the continuation of the work, the results of which were presented to GRSG on its 78<sup>th</sup> meeting as informal doc. No.6. Those rollover bus accidents were collected which have been reported by the Hungarian press (Radio, TV, newspapers) The data (see Table 1.) are not officially checked, neither technical nor medical examinations, investigations have been made.

### 2. The summary of the statistics

2.1. The same structure is used when summarising the data as it was used earlier to be able to compare the two statistics and their sum, too. Some explanation to Table 2. are given below (the referring numbers are used in Table 2. as well)

- (1) the countries may be „involved” as manufacturer, approval authority, operator or the scene of the accident
- (2) rollover into a ditch, down on a slope, not more than one complete rotation, similar or close to the „standard rollover”
- (3) more than one rotation, more than 8 m level difference
- (4) frontal collision and rollover, rollover and fire, falling into water, etc.
- (5) e.g. collapse, when the survival space was obviously damaged
- (6) the survival space very likely did not damage

2.2. The rollover frequency of other bus categories as used in Reg.36.

mini bus	2	min 4%
midi bus	1	min 2%
high decker	5	min 11%
double decker	4	min 9%
school bus	1	min 2%

2.3. The injury risk in those rollover accidents, which are not too severe ones (categories „turned on side” and „rollover from the road”) The total number of this kind of rollover accidents: 30 (67%)

fatalities	131	(27%)
serious injuries	145	(69%)
light injuries	193	(79%)
injuries without classification	177	(55%)

2.4. The site of the rollover accident

Hungary	14	30%
Europe (excluding Hungary)	20	44%
Other than Europe	12	26%

Hungary is over represented, but that is natural, because this statistics is based on the Hungarian press reports. From outside Europe only the very severe accidents are reported.

In 1995 the number of the Hungarian bus fleet (registered buses) was around 20.000. The European fleet at that time was roughly 550.000 units.

If Hungary can „produce” yearly 5-7 bus rollover accident then the European figure is expected in the range of 150-200 bus rollover /year.

**Bus rollover accident between 01.01.2000 - 01.03.2001**

**Table 1.**

	<b>Date District (city) Country</b>	<b>Bus type Category Operator</b>	<b>Circumstances of rollover</b>	<b>Fatalities Injuries</b>	<b>Damage of bus structure</b>
1.	02.03.2000 Highway A3, Passau Germany	C.III. Austrian operator	Passing a van slipped on the road and turned on side	- 4 serious injuries 52 light injuries	Many the seats were dislodged, broken
2.	13.05.2000 Highway M17 Bosnia	C.III 12 m Bosnian operator	After bursting a tyre the bus, breaking through the rail of a bridge, the bus turned into a river. The rear wall was in the water, the other part of the bus on the bank of the river. Level difference of rollover: 15-20 m.	43 fatalities 12 injuries	The roof completely collapsed, the front wall was shortened because of hitting the bridge rail
3.	10.06.2000 Highway M1 Győr Hungary	Kassbohrer C.III. 12 m RASINATRANS (Swiss)	Drivers fault. On straight highway the bus rolled down crosswise on a normal slope, having a level difference of 1-1,5 m	2 fatalities 9 serious injuries 2 light injuries	Substantial distortion of the superstructure, plastic hinges on the floor lever, too. The mid part of the roof necked down
4.	24.06.2000 Between Ilz-Graz Austria	C.III. HD. Polish operator	On the way the bus slipped and twirled, turned on its side and slipped away on 40 m. Nobody was ejected.	- 8 serious injuries 34 light injuries (altogether 52 passengers)	The roof slightly has been deformed, the survival spaces was not harmed
5.	01.07.2000 Krakow-Katowice Poland	NEOPLAN C.III. 3 axles DD.	Breaking through the rail of a bridge the bus turned down	2 fatalities	
6.	06.07.2000 Aranda de Duero Spain	C.III Spanish operator	The bus with students on board run into a truck transporting pigs, and after that rolled down into a ditch.	24 fatalities 30 injuries	
7.	10.07.2000 Road 66, Sántos Hungary	IKARUS 256 C.III 12 m Kapos Volán (HU)	The bus driver wanted to elude a slipping trailer, after sudden steering the rolled down into 1 m deep ditch. The bus was almost standing before the rollover (no speed)	- 9 serious injuries 14 light injuries (altogether 31 passengers)	The superstructure did not deform, the survival space was not harmed
8.	08.07.2000 Lincsou China	C.I. Chinese operator	Breaking through the rail of a bridge the bus turned into the river. After 30 m it „landed” on its roof on the water	65 fatalities	
9.	11.07.2000 Road A71, Orleans France	C.III. 3 axles, DD. Belgian operator	The driver fall asleep, the bus rolled down on the standard slope into a 1-1.2 m deep ditch.	2 fatalities 12 series injuries	Typical four plastic hinges deformation of the superstructure
10.	15.07.2000 Guayllebamba Equador		Too high speed, maybe break fault the bus broke through the rails of a bridge turned down into a depth of 40 m	17 fatalities 28 series injuries	

11.	17.07.2000 Újhartyán Hungary		On a wet, slippery road the bus slipped and turned into the ditch		
12.	01.09.2000 Ópusztaszer Hungary	NEOPLAN C.III. 12 m	In an „S” curve, on slippery road the bus slipped and turned into the 1 m deep ditch. 13 persons were ejected, but among them there was no fatality	6 fatalities 20 injuries (altogether 27 passengers)	The roof completely collapsed and broke away
13.	08.09.2000 Kula Turkey	workers bus Turkish operator	The driver fell asleep, the bus rolled into the ditch next to the road	11 fatalities 26 injuries	
14.	21.09.2000 Tyrol, Terfeus Austria	School-bus African operator	The bus slipped down from the road and rolled over	1 fatality (driver) 9 light injuries (altogether 18 passengers)	
15.	24.10.2000  Turkey	C.III. 3 axles, HD.	Two buses collided and one of them rolled down from the road on a standard slope	13 fatalities	The roof was strongly deformed, survival space was harmed, seats were dislodged, broken
16.	26.12.200 Bausalan Philippine Islands	C.II. domestic operator	Two buses collided and one of them rolled over into 20 m deep valley	32 fatalities 2 serious injuries (altogether 70 passengers)	
17.	24.12.2000 Cape Town South-Africa	C.II. domestic operator	On hilly, serpentine road the driver lost the control of the bus which rolled down into a 30 m deep chasm	20 fatalities 45 serious injuries	
18.	03.01.2001 Csapdi village Hungary	IKARUS 256 C.III 11 m Vértés Volán (local)	On a slippery, icy road, low speed, the bus rolled into the ditch. Four buses, following this one, also slipped into the ditch without rollover	1 serious injury 12 light injury (altogether 210 passengers in the 5 buses)	The superstructure has been deformed but the survival space very likely was not harmed
19.	01.01.2001 Áporka village Hungary	minibus Hungarian operator	The bus slipped and rolled over	3 fatalities 1 serious injury 3 light injuries	
20.	18.01.2001 Highway M3 Hungary	minibus	The bus rolled over, the circumstances were not cleared up.	8 serious injuries 5 light injuries	
21.	23.01.2001 Kiskunfélegyháza Hungary	German operator	The driver tried to avoid a collision with trucks, after sudden steering the bus turned down into a ditch	1 serious injuries (the bus was empty, only the driver was injured)	
22.	11.02.2001 Avila Spain	NECO C.III. 12 m HD Spanish operator	The bus rolled down into a ditch	7 fatalities 4 serious injuries more light injuries	Very slight deformation of the superstructure, the survival space was not harmed
	16.02.2001		25 cm deep snow, the bus slipped down from a way up of		The structure slightly deformed, the

23.	Söul South Korea	C.I. 11 m local operator	a bridge. 3 m level difference		survival space was not harmed
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**Table 2**

<b>SUMMERY OF ROLLOVER STATISTICS</b>	<b>Statistics I. 1990-1999</b>	<b>Statistics II 01.01.2000 - 01.03.2001</b>	<b>Sum of I. and II</b>
The number of accidents	23	23	46
The number of countries involved <sup>(1)</sup>	min. 15	min. 15	min.22
The total number of			
• fatalities	238	254	492
• serious injuries	103	107	210
• light injuries	122	123	245
• injuries without classification	197	122	319
Type of rollover accident (severity)			
• turned on side	4	2	6
• rollover from the road <sup>(2)</sup>	13	12	25
• serious rollover <sup>(3)</sup>	3	6	9
• combined accident with rollover <sup>(4)</sup>	3	3	6
The category of rolled buses			
• Category I (city, suburban)	2	2	4
• Category II (intercity, local)	1	2	3
• Category III (tourist, logdistance)	20	12	33
• unknown	-	6	6
Deformation of the superstructure			
• serious deformation <sup>(5)</sup>	4	5	9
• slight deformation <sup>(6)</sup>	5	5	10
• no information	14	13	27