



EUROPEAN GLIDING UNION

Representative Organisation of European Glider Pilots

Note to EGU Board members from David Roberts (author of this report) and Robert Danewid

Date: 2nd December 2008

Subject: **Accident statistics**

Introduction

This review is based on 10 years of data from 1998 to 2007, by each year, relating in each country:

- Number of fatal accidents (note: this is not the same as fatalities, which is the number of pilots losing their lives, which number will always be equal to or greater than the number of accidents)
- Number of recorded accidents
- Number of launches
- Number of members of clubs
- Number of gliders

Information generated from the raw data

The raw data is constructed into tables to identify, over the ten year period for each member country. Most of this information is presented in this note.

(a) Fatal Accidents

- The average number of launches for one fatal accident to occur (Table B)
- The average number of fatal accidents in relation to the average number of members (Table C)
- The average number of fatal accidents in relation to the number of gliders
- The total number of fatal accidents and the average per annum (Table A)
- The fatal accident rate per 100,000 launches over ten years (Table A)

(b) Non-fatal accidents

- The average number of launches for one non-fatal accident to occur (Table B)
- The average number of non-fatal accidents in relation to the average number of members
- The average number of non-fatal accidents in relation to the number of gliders

(c) Other information

- The total average annual launches in member countries (Table A)
- The total average number of members in member countries (Table F)
- The total average number of gliders in member countries (Table E)

Review of data

David Roberts has reviewed the file provided and corrected some errors in the compilation of the statistics, arising from data links, calculations, etc. Part of the problems identified relate to the fact that some member countries have not supplied a full 10 year history of data, and even where there is a 10 year data set it is not up to date.

Completeness of data

The following members have provided full data sets for 10 years 1998-2007:

Member Country	EU status	Fatal Accidents	Non-fatal Accidents	# of Launches	# of Members	# of Gliders
Belgium	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Czech republic	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Denmark	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
France	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Germany (1)	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Ireland (2)	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Netherlands (1)	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Norway (1)	Non-EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Poland (3)	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Sweden (4)	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
Switzerland (5)	Non-EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07
UK	EU	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07	10 yrs 98-07

Notes

- (1) Launch numbers estimated by member country for all or most years
- (2) Launch and member numbers provided to nearest 100 units
- (3) Membership numbers estimated by member country
- (4) 1999 & 2001 launch numbers estimated by member country
- (5) 2007 launch numbers estimated by member country

The following members have less than full data sets for 10 years 1998-2007:

Member Country	EU status	Fatal Accidents	Non-fatal Accidents	# Launches	# Members	# Gliders
Austria (6)	EU	9 yrs 97-05	9 yrs 97-05	9 yrs 97-05	10 yrs 97-06	10 yrs 97-06
Finland (6)	EU	9 yrs 98-06	9 yrs 98-06	9 yrs 98-06	9 yrs 98-06	8 yrs 98-05
Serbia (8)	Non-EU	2 yrs 06-07	2 yrs 06-07	2 yrs 06-07	2 yrs 06-07	2 yrs 06-07
Slovakia (9)	EU	7 yrs 98-04	7 yrs 98-04	7 yrs 98-04	7 yrs 98-04	7 yrs 98-04

Notes:

- (6) Launch numbers available 1996 thus ten year launch averages possible 96-05 (1 yr lag)
- (7) New EGU member; statistics only for 06-07
- (8) New member of EGU
- (9) All figures available 95-97 therefore 10 year averages provided for 95-04 (3 yr lag).

The following members have not provided any data sets for 10 years 1998-2007:

Member Country	EU status
Greece	EU
Iceland	Non-EU
Italy	EU
Luxembourg	EU
Slovenia	EU
Spain	EU

The following EU countries, not included in the tables above, are not members of the EGU and therefore no statistics are available:

Country	EU status
Bulgaria	EU
Cyprus	EU
Estonia	EU
Hungary	EU
Latvia	EU
Lithuania	EU
Portugal	EU
Malta	EU
Romania	EU

Bases of data

1. The definition of what constitutes an accident may vary between countries
2. The number of launches recorded in some countries appears accurate (to probably +/- 2%)
3. Other countries do not have, or cannot obtain, reliable data for launch numbers
4. The basis of recording the number of members may vary from country to country
5. The membership numbers only correlate with the IGC record (vide: reports from John Roake of NZ) in a few cases.
6. The recorded number for gliders may require further clarification, particularly as to whether they include TMGs

General observations

1. In relation to the relationship between the number of reported accidents and the number of fatal accidents, over 10 years, there are some significant variations, with Switzerland showing a high proportion of fatal accidents to total accidents (42%). Is this because of the accident definition being limited and therefore the number of reported accidents is unusually low?
2. Countries in which the % of fatal accidents to total accidents is above 10% are ones with mountain flying (except Germany, other than Bavaria). That is Austria, Switzerland and France. New Zealand's statistics show a similar higher ratio.
3. Accident rates for member countries with low numbers of pilots, launches and gliders need to be discounted in reviewing the tables of accident rates, as the numbers involved do not constitute a sufficient 'population' statistically, e.g. Ireland.

Summary results

A. Fatal Accident rates

The following table shows, in descending order, the number of fatal accidents per 100,000 launches over the ten year period 1998-2007 (but Austria is a 9 year average 1997-2005, and Finland is 10 years 1997 – 2006). Ireland and Serbia are excluded due to a statistically low 'populations'.

	1998-2007 10 Year	1998- 2007 10 Year	1998-2007 10 Year	1998-2007 10 Year
Fatal Accident rate order	Total Fatal Accidents	Average Fatal Accidents p.a.	Average Launches p.a.	Average Fatal Accident Rate per 100k launches
Switzerland	32	3.20	97,274	3.39
Poland	10	1.00	29,703	3.37
<i>New Zealand</i> <i>5 years 2003-2007</i>	<i>6</i>	<i>0.60</i>	<i>21,738</i>	<i>2.76</i>
France	46	4.60	187,215	2.46
Austria <i>9 year average 1997-2005</i>	<i>21</i>	<i>2.33</i>	97,275	2.40
Belgium <i>Part of Belgium only</i>	4	0.40	20,261	1.97
<i>USA</i> <i>Rough estimated launch #s</i>	<i>59</i>	<i>5.90</i>	<i>440,000</i>	<i>1.34</i>
Germany <i>Estimated launch numbers</i>	136	13.60	1,019,878	1.33
UK	37	3.70	338,673	1.09
Norway <i>Estimated launch numbers</i>	1	0.10	11,550	0.87
Denmark	5	0.50	60,268	0.83
Sweden	4	0.40	54,936	0.73
Czech Republic	5	0.50	82,019	0.61
Slovakia	1	0.10	17,098	0.58
Netherlands <i>Estimated launch numbers</i>	7	0.70	132,800	0.53
Finland <i>10 years 1997-2006</i>	0	0.00	34,072	0.00
Overall Totals	375	37.73	2,641,759	1.76

Apart from Poland, the five highest fatal accident rate European countries (and New Zealand) all have alpine mountain flying, which indicates a possible correlation in terms of risk. They are also areas to which visitor from other 'flat' countries go, and the visitor fatal accidents are included in the analyses (check?).

The Nordic countries, Czech Republic, Slovakia and The Netherlands have the lowest fatal accident rates at < 1.0 per 100k launches.

B. Number of accidents in relation to activity (launches) in descending order

(1) There is an accident on average in every **x** number of launches, based on 10 year histories 1998-2007:

Finland	9 years 1998-2006	26209
Switzerland	But see comment (1) in General Observations	12404
Germany		9802
Netherlands		7632
UK		7543
France		5442
Ireland		4400
<i>New Zealand</i>	<i>5 years 2003-07</i>	4940
Slovakia	10 years 95-04	4885
Austria	9 years 97-05	4422
Denmark		4215
Sweden		4100
Czech Republic		3982
Belgium		2412
Poland		1768
Norway	8 years 2000-07	1431
<i>USA</i>		<i>n/a</i>

(2) There is a **fatal** accident on average in every **x** number of launches, based on 10 year histories 1998-2007:

Finland	9 years 1998-2006	No fatals 9 yrs
Norway	8 years 2000-07	No fatals 8 yrs
Netherlands		189714
Slovakia	10 years 95-04	170978
Czech Republic		164038
Sweden		137340
Denmark		120537
UK		91533
Germany		74991
Belgium		50653
Austria	9 years 97-05	41689
France		40699
Poland		29703
Switzerland		29461
Ireland	Low population statistically	17600
<i>New Zealand</i>	<i>5 years 2003-07</i>	36230
<i>USA</i>		<i>n/a</i>

C. Member fatal accident rates

On average one in every x members has a **fatal** accident annually:

Finland	None
Norway	20288
Slovakia	7943
Czech Republic	7501
Sweden	6932
Netherlands	6411
Poland	3273
Germany	2745
Denmark	2684
France	2511
UK	2340
Belgium	2302
<i>USA</i>	<i>2068</i>
Austria	1857
<i>New Zealand</i>	<i>1556</i>
Ireland	1270
Switzerland	825

D. Ratio of fatal accidents to all accidents

	Period if not 10 years 1998-2007	Total Fatal Accidents 10 years 1998-2007	Total of all Accidents 10 years 1998-2007	Fatal Accidents as % of all Accidents 10 years 1998-2007
Austria	9 Years 97-05	21	198	10.6%
Belgium		4	84	4.8%
Czech Republic		5	206	2.4%
Denmark		5	143	3.5%
Finland	10 years 97-06	0	13	0.0%
France		46	344	13.4%
Germany		136	1123	12.1%
Ireland	Low data population	1	4	25.0%
Netherlands	8 years 2000-07	6	174	3.4%
Norway	8 years 2000-07	0	65	0.0%
Poland		10	168	6.0%
Slovakia	10 years 95-04	1	35	2.9%
Sweden		4	134	3.0%
Switzerland	See comment	32	76	42.1%
UK		37	449	8.2%
Total		308	3,216	9.6%

Greece	Not available
Iceland	Not available
Italy	Not available
Luxembourg	Not available
Serbia	Data population too small
Slovenia	Not available

<i>New Zealand</i>	<i>6</i>	<i>55</i>	<i>10.9%</i>
<i>USA</i>	<i>59</i>	<i>Not available</i>	

Comment: The application of the definition of what constitutes as accident may have a bearing on the resultant % ratios in the above table. Switzerland in particular is a rather alarming statistic, if true.

E. Number of gliders

The number of gliders in 1998 and 2007, the beginning and end of the reporting period, is recorded as follows:

	Year if not			Year if not
	1998	2007	2007	2007
				200
Austria		1117	681	6
Belgium		278	278	
Czech Republic		543	687	
Denmark		474	493	
				200
Finland		335	385	5
France		1837	1532	
Germany		7805	7769	
Ireland		21	30	
Netherlands		695	718	
Norway		155	155	
Poland		850	855	
	200			
Serbia	6	50	50	
Sweden		550	420	
Switzerland		1274	1189	
UK		2419	2550	
Total		18403	17792	
Other EGU Members				
Greece		not available		
Iceland		not available		
Italy		not available		
Luxembourg		not available		
Slovakia		not available		
Slovenia		not available		
Spain		not available		
Non EGU Members in EU				
Latvia		not available		
Lithuania		not available		
Estonia		not available		
Portugal		not available		
Hungary		not available		
Cyprus		not available		
Bulgaria		not available		
Malta		not available		
Romania		not available		
Non European countries				
<i>USA (estimated)</i>		<i>4500</i>	<i>4500</i>	200
<i>New Zealand</i>		<i>321</i>	<i>370</i>	3

F. Number of Members

The number of members in 1998 and 2007, the beginning and end of the reporting period, is as follows:

	Year if not			Year if not
	1998	1998	2007	2007
Austria		4497	4066	2006
Belgium		970	793	
Czech Republic		3780	3209	
Denmark		1921	1712	
Finland		2699	1965	2006
France		13075	12296	
Germany		36788	30792	
Ireland		90	110	
Netherlands		4125	3523	
Norway		1599	1411	
Poland (estimated only)		3000	3000	
Serbia	2006	100	100	
Slovakia		846	652	2004
Sweden		3013	2100	
Switzerland		3279	2760	
UK		9007	7950	
Total (13.9% down)		88789	76439	

Other EGU Members

Greece	not available
Iceland	not available
Italy	not available
Luxembourg	not available
Slovenia	not available
Spain	not available

Non EGU Members in EU

Latvia	not available
Lithuania	not available
Estonia	not available
Portugal	not available
Hungary	not available
Cyprus	not available
Bulgaria	not available
Malta	not available
Romania	not available

Non European countries

<i>USA (estimated)</i>	13750	12500	2003
<i>New Zealand</i>	987	902	2006

Concluding Remarks

Ideally the statistics should be complete and we would urge those member countries where data is missing to try and complete their data, where possible.

The collection of raw data and the compilation of structured information is only really the starting point. The second level of data that would really add value to the work would be the categorisation of causes of accidents, for at least the fatal accidents. What are the causes of the accidents? Only in this way can member associations address the safety issues that lie behind the figures.

In some countries this analysis is being done. For example, in the UK, Hugh Browning has carried out an extensive analysis of all UK gliding accidents covering a long period of time and produced a comprehensive analysis of the recorded causes of accidents. In other countries too, such analyses exist. When he was on the EGU Board, and before joining EASA, Matthias Borgmeier started the work to categorise the fatal accidents by primary cause. This work needs to be continued.

EASA has published its Regulatory Impact Assessment (RIA) for the licensing proposals. See: http://hub.easa.europa.eu/crt/view-doc/id_60 Reference is made in the RIA the level of fatal accidents in the various GA sectors. Whilst the EASA analysis is somewhat superficial, nevertheless it holds potential dangers for the future in that it may be used inappropriately to introduce further rules based on incomplete evidence.

EGU can influence EASA in its approach, but it can only do so with good quality data and information. EGU, in cooperation with its members, should therefore make every effort to develop further the accident analysis each year, so as to inform the regulators with accurate, comprehensive (in scope) and complete information.

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