



NOTICE OF PROPOSED AMENDMENT (NPA) No 2009-02G1

**DRAFT OPINIONS OF THE EUROPEAN AVIATION SAFETY AGENCY,
FOR A COMMISSION REGULATION establishing the implementing rules for air
operations of Community operators**

and

**DRAFT DECISIONS OF THE EXECUTIVE DIRECTOR OF THE EUROPEAN AVIATION
SAFETY AGENCY on
acceptable means of compliance, certification specifications and guidance material
related to the implementing rules for air operations of Community operators**

"Implementing Rules for Air Operations of Community Operators"

**G1. Corrigendum to Regulatory Impact Assessment for the Supplementing Measures
for Air Operations (per Article 8(5) of Regulation (EC) No 216/2008)
concerning sailplanes and balloons**

Introduction

The Agency has identified an editing error in the Regulatory Impact Assessment to the implementing rules for air operations of Community operators, published as NPA 2009-02g. The Agency is herewith publishing a corrigendum to NPA 2009-02g. The corrections are highlighted in yellow.

The following paragraphs are affected:

- 2.3.2.7 Sailplanes and balloons
- 2.3.2.8 Summary of OPS safety analysis
- 2.3.2.9 Cost of safety events
- 2.6.3 Safety Impact.

The corrections affect the area of balloon and sailplane operations however, do not impact the conclusions.

Page 30/31, paragraph 2.3.2.7 Sailplanes and balloons

Paragraph 2.3.2.7 Sailplanes and balloons shall be replaced by the following paragraph:

2.3.2.7 Sailplanes and balloons

The available data has been published in the Agency's "Annual Safety Review" for 2006 and 2007. It is summarised in table 12 below:

Type of aircraft	Year	Number of accidents		Ratio Total/fatal accidents	Fatalities	Ratio fatalities/fatal accident
		Total	Fatal		Total	
Sailplanes	2006	195	22		24	
	2007	173	17		20	
Total sailplanes		368	39		44	
Average per year		184	19.5	9.4	2244	1.12-2
Balloons	2006	29	0		0	
	2007	15	0		0	
Total balloons		34	0		0	
Average per year		17	0		0	N.A.

Table 12: Summary of accidents (years 2006 and 2007) in EASA Member States for sailplanes and balloons

Even if the data available is not exhaustive, since covering only two years and maybe only partially reported, for the time being the above estimations on the averages will be used in the present RIA.

For balloons or sailplanes, it has to be recalled that in paragraph 2.3.2.6 of NPA 2008-22f, the Agency concluded that around 80% of the total accidents were due to FCL causes. **For the purpose of this RIA, around 10 %** Consequently, around 20 % of the accidents are assumed to be caused by operational causal factors.

Page 31, paragraph 2.3.2.8 Summary of OPS safety analysis

Paragraph 2.3.2.8 Summary of OPS safety analysis shall be replaced by the following paragraph:

2.3.2.8 Summary of OPS safety analysis

The most significant figures presented in the above paragraphs from 2.3.1.2 to 2.3.1.7 can be summarised as follows, with reference to the EASA Member States:

Item	CAT by large aeroplanes	CAT by H	CAT > 2.25t	"non-complex" motor aircraft	Air taxi	Corporate	Owner operated	Sail-planes	Balloons
Average number of accidents/yr	20.5	7.6	32	693	5	0.7	1.9	184	17
Average number fatal accidents/ year	2	2.9	5.7	96	0.9	0.1	0.3	19.5	0
Ratio total accidents over fatal	10	2.6	5.6	7.7	5.5	5.5	5.5	9.4	N.A.
Victims/ fatal accident	30	3.7	14	1.8	7	7	3	1.1	N.A.
Percent of accidents for OPS	45%	45%	45%	10%	45%	30%	10%	1020%	1020%
Average number of accidents/yr for OPS	9.2	3.4	14.4	69	2.3	0.2	0.2	18.4 36.8	1.7 3.4
Average N. fatal accidents/yr for OPS	0.9	1.3	2.6	9	0.5	0.03	0.04	2 3.9	0
Average number of victims/yr for OPS	27	4.8	36	16	3.2	0.2	0.1	2.2 8.6	0
Percent accidents mitigated by cabin crews	15%	Not estim.	Not applicable	Not applicable	Not est.	N.A.	N.A.	N.A.	Not applicable
Average number of accidents/ year mitigated by cabin crews	3	Not estim.	Not applicable	Not applicable	Not est.	N.A.	N.A.	N.A.	Not applicable
Average number of saved lives/year by cabin crews	90	Not estim.	Not applicable	Not applicable	Not est.	N.A	N.A	N.A	Not applicable

Table 13: Summary of safety analysis

Page 31-35, paragraph 2.3.2.9 Cost of safety events

Paragraph 2.3.2.9 Cost of safety events shall be replaced by the following paragraph:

2.3.2.9 Cost of safety events

In order to estimate the "cost of accidents" it is necessary to first establish some basic figures. The main sources for this have been:

- Economic Values Handbook prepared by the US Federal Aviation Administration (FAA)³⁸;
- The EUROCONTROL publication "Standard Inputs for EUROCONTROL Cost Benefit Analyses" edition 2007³⁹.

From the former, the inflation rates applicable in the US have been copied, as in Table 14 below:

Year	Inflation rate
2000	2.180
2001	2.409
2002	1.750
2003	2.131
2004	2.837
2005	3.025
2006	3.186

Table 14: Inflation rate in the USA⁴⁰

Then the exchange rate (2007) of 1.370 US \$ per 1 € has been applied.⁴¹

In the FAA data all the figures were obviously in US \$ and in many cases calculated in past years (so they had to be corrected taking into account the inflation). The EUROCONTROL data were expressed in € and edited in 2007, so they have been used as published.

The most relevant parameters used in the following are contained in Table 15:

Parameter	USA FAA				ECTL	EASA
	kUS \$	Referred to year	Value in 2007			
			kUS \$	k€		
Residual value of a large aeroplane	11,460	2002	12,795	9,336		
Residual value of a "complex" aircraft	2,022	2003	2,215	1,616		
Residual value of a "non complex" motorized aircraft						100
Residual value of a sailplane						50
Residual value of a balloon						910
Repair cost of large aeroplane	3,700	1999	4,399	3,210		
Repair cost of a "complex" aircraft	85.15	1999	101.23	73.86		
Repair cost of a "non complex" motor-powered aircraft						3110
Investigation cost for large aircraft	449	2002	501.32	365.8		
Investigation cost for lighter motorized aircraft	35.1	2002	39.2	28.6		
Investigation cost for sailplane or balloon						62

Table 15: Economic parameters to assess the "cost of accidents"

³⁸ <http://www.faa.gov/>

³⁹ http://www.eurocontrol.int/corporate/public/subsite_homepage/index.html

⁴⁰ Economic values www.faa.gov

⁴¹ European Central Bank www.ecb.eu

The report "US Air Carrier Operations – Calendar year 2003"⁴² issued by the National Transport Safety Board (NTSB) of the US contains data about the consequences of accidents occurred to commercial operators of large aeroplanes (regulated by FAA "Part 121" in the US) for the period 1994-2003. These data is summarised in Table 16 below:

Consequences of accidents					
To aircraft		To humans		TOTAL	
	Fatal	Serious injuries	Minor injuries	No injuries	
Destroyed	16	1	5	0	22
Substantial damage	2	11	37	160	210
Minor damage	6	278	0	8	41
None	2	159	0	2	163
TOTAL	26	198	42	170	436
Percentage	6	45	10	39	100

Table 16: Consequences of accidents 1994-2003 (NTSB)

From the above data it can be observed that:

- Aircraft were normally destroyed only in conjunction with a fatal accident;
- A significant number of injuries occurred with no damage to aircraft: this is the typical case caused by turbulence in flight, this (159), due to OPS causes, represents 36 % of the total 436 accidents; It is assumed that this can be applied to the EU as well. However, in this case only 2 (not 22) injured persons per occurrence will be assumed for large aeroplanes and 1 for helicopters.
- Around 45 % of the accidents (over the total of 436) lead to minor (37) or no (160) injuries but substantial damage to the aircraft.

Based on this data, assumptions and estimations, the cost of non-fatal accidents can be estimated as follows:

Item	CAT by large aeroplanes	CAT by H	Airplane s >2.25t	Non complex motor	Business Aviation			Sailplanes	Balloons	TOTAL COST
					Air taxi	Corporate	Owner operated			K€/year
Average N. OPS of accidents/yr	9.2	3.4	14.4	69	1.5	0.2	0.2	18.437	1.73,4	
Average N. OPS accidents/yr with serious injuries & no damage (36%)	3.3	1.2	5.2	N.A.	0.5	0.07	0.07	N.A.	N.A.	
Number of serious injuries/accident	2	2	2	N.A.	2	2	2	N.A.	N.A.	
Serious injuries/year	6.6	2.4	10.4	N.A.	1.1	0.1	0.1	N.A.	N.A.	
Average N. OPS accidents/yr with minor injuries & subst. damage (45%)	4.1	1.5	6.5	69.0	0.7	0.1	0.1	9.237,0	0.91,5	

⁴² <http://amelia.db.erau.edu/reports/ntsb/arg/ARC07-01.pdf> . pp 10-12, Tables 4-7

Number of minor injuries/accident	22	3.7	7	1.8	7	7	1.8	0.42,2	1.12,2	
Minor injuries/year	91	3.7	8.4	124	4.9	0.7	0.3	3.78±	0.97,5	
Cost of substantial damage (k€/year)	13,289	113	480	2,139 5,106	50	7	7	460±,850	8±5	16,552 20,917
Cost of investigation (k€/year)	3,358	97	412	1,973	43	6	6	11074	107	6,015 5,976
TOTAL COST (k€/year)	16,647	210	891	4,112 7,079	93	12	12	570 1,924	18 22	22,567 26,892

Table 17: Cost of non-fatal accidents

The above data does not consider other costs related to injuries. Neither it includes costs which could emerge as a consequence of an accident, such as used fire extinguishing agents, disruption of schedule, disruption of operations at aerodromes, damage to third party property on the ground, search and rescue and so on.

Along the same lines the cost of fatal accidents can be estimated in Table 18 below:

Item	CAT by large aeroplanes	CAT by H	CAT >2.25t MTOW	Non complex motor	Air taxi	Corpo rate	Owner operated	S	TOTAL COST
									K€/year
Average number of fatal accidents/yr linked to OPS	0.9	1.3	2.6	9.0	0.5	0.03	0.04	2.0 3-9	
Victims/ fatal accident	22	3.7	7	1.8	7	7	3	1.1 2-2	
Average number of victims/yr linked to OPS	20	3.3	3.5	16	2.1	0.2	0.1	2.2 8-6	
Residual value of destroyed aircraft (k€)	8,402	2,101	4,202	900	808	48	65	100 195	16,626 16,721
Cost of investigation (k€)	404	38	75	261	15	1	1	12 8	807 803
TOTAL COST (k€)	8,807	2,139	4,277	1,161	823	49	66	112 203	17,433 17,523

Table 18: Cost of fatal accidents

Finally, the number of lives possibly saved by cabin crews after an accident can be estimated as follows:

Contribution by cabin crews to mitigate the consequences of accidents for large aeroplanes	
Percent accidents mitigated by cabin crews	15%
Average number of accidents/ year mitigated by cabin crews	3
Average number of saved lives/year by cabin crews	90

Table 19: The contribution of cabin crew

Page 50-52, paragraph 2.6.3 Safety Impact

Paragraph 2.6.3 Safety Impact shall be replaced by the following paragraph:

2.6.3 Safety Impact

The scheduled CAT operators by large aeroplanes will not be significantly affected by any of the options under consideration. Therefore, it is no longer necessary to consider them in present paragraph 2.6.

For the other categories of CAT operators using complex motor-powered aircraft (the vast majority of **CAT operators for non-scheduled services**) they will be affected by **options 1B and 1C**. These options in essence move a significant volume of former EU-OPS/JAR-OPS prescriptions from the level of legally binding IRs/Section 1 to more flexible AMCs, potentially more suited to be tailored to the needs of SMEs (less than 500 employees). After the familiarisation with the new rules during the transition, this new structure of the rules will allow SMEs to save some of the effort today spent on bureaucratic tasks while concentrating on really essential safety elements. The same will happen in the competent authorities which, more than "ticking boxes" in the audit protocols, will have to discuss and approve tailored AMCs to each regulated organisation.

For **CAT operators by balloons or sailplanes**, it has to be recalled that in paragraph 2.3.2.6 of the FCL RIA, the Agency concluded that around 80% of the total accidents were due to FCL causes. **For this RIA it is assumed that** consequently, **around 1020% of said accidents can be assumed to be attributed to operational causal factors**. With reference to the data published in the FCL RIA, the following estimations for sailplanes registered in EASA Member States can be offered, although on the basis of very limited and possibly not complete data:

- **1837** accidents of sailplanes per year, linked to OPS factors;
- **24** of them fatal;
- Representing **2.29** victims/year linked to OPS factors.

And for balloons:

- **1.73-4** accidents of balloons per year, linked to OPS factors;
- none of them fatal.

It has to be noted that in paragraph 2.3.2.8 above, it has been estimated that in one year in the EU 27 + 4 about 9.2 accidents for CAT by large aeroplanes can be expected in relation to OPS causal factors. The severity of these latter events is much higher as well as the media echo. However, in absolute number of accidents it is clear that there is scope for improving the safety of CAT, at least by sailplanes.

Any of the three options under consideration will put CAT operators of balloons and sailplanes across the EU 27 + 4 under the oversight by competent authorities (even 1C). However, option 1A, might divert part of the scarce resources available into those small organisations (typically much less than 50 full time employees), towards bureaucratic obligations, so diverting available effort from actual safety matters. **Option 1A is therefore negative** in that respect. Nevertheless, also **option 1C is marginally negative**. While the oversight in 1B precedes certification, in 1C it follows the declaration. On the contrary **option 1B (certification, but rules tailored to complexity of operations) could produce a safety benefit**.

The controlled mechanism for the evolution of the AMCs leading to collective efforts to improve them ensures that **any of the options will lead to sufficient uniformity** of the safety levels.

Since there are no instruments available at this moment to measure the extent to which the options would contribute to the level of safety, there are no means for the Agency to express the number of incidents/accidents prevented, in monetary value. The economic aspects are however considered in the paragraphs above.

In conclusion, applying the methodology presented in paragraph 2.1.2 above (including a weight factor of 3 for the safety impacts), and having selected the applicable result indicators linked to specific objectives from paragraph 2.4.3, scores can be attributed for the safety impact of the three options related to the safety of CAT operations, as presented in the following Table 28:

Specific Objectives	Scoring of options		
	1A	1B	1C
	prescriptive rules	proportionate rules	Declaration
High safety of air operations	-2	3	1
Uniform safety	2	2	2
TOTAL	0	5	3
AVERAGE SCORE	0	2,5	1,5
WEIGHTED AVERAGE (Score x 3 for safety)	0	7,5	4,5
ROUNDED WEIGHTED AVERAGE	0	8	5

Table 28: Scoring of the safety impact for CAT operators