Annual

Safety Review 2024

Chapter 4

Balloons

The scope of this chapter covers hot air balloon operations where the state of the registry or the state of operator is an EASA Member State. The data presented is based on the accidents and serious incidents collected by the Agency under Regulation (EU) 996/2010 on accident and serious incident investigation and Regulation (EU) 376/2014 on occurrence reporting, and through actively searching for those events from other official sources.

The chapter provides in the core document the key statistics and occurrence categories for balloon operations. Advanced statistics are then provided in a domain-specific appendix, giving an overview of the safety risks for these operations at the European level. These advanced statistics are solely derived from occurrence data from the European Common Repository (ECR).

The list of fatal accidents associated with the scope of this chapter is provided in Appendix 1 of this document.

The advanced statistics associated with the scope of this chapter are provided in Appendix 4 of this document.

Key statistics

The key statistics for this domain are in Table 4.1 and Table 4.2 and include a comparison of the number of accidents (fatal and non-fatal) and serious incidents for the last year and the previous 10-year period. It also includes a comparison of the fatalities and serious injuries sustained in those accidents during the same timeframe.

Table 4.1 shows a comparison between the 10-year average vs. 2023. This indicates that the number of fatal accidents and the number of serious incidents is decreasing compared to the 10-year average. Non-fatal accidents, however, continue to show a small increase compared to the 10-year average.

Table 4.2 presents the number of fatalities and serious injuries for 2023 vs. the 10-year average.

The number of fatalities is at the minimum and has decreased in 2023 compared to the 10-year average, with the number of serious injuries in 2023 close to even when compared to the 10-year average, with an indication of slight increase.

A better understanding of the level of balloon safety in EASA Member States could be achieved if exposure data showing the number of flights was collected at regulatory level. EASA encourages all national authorities to collect, aggregate and share such data for the benefit of all.

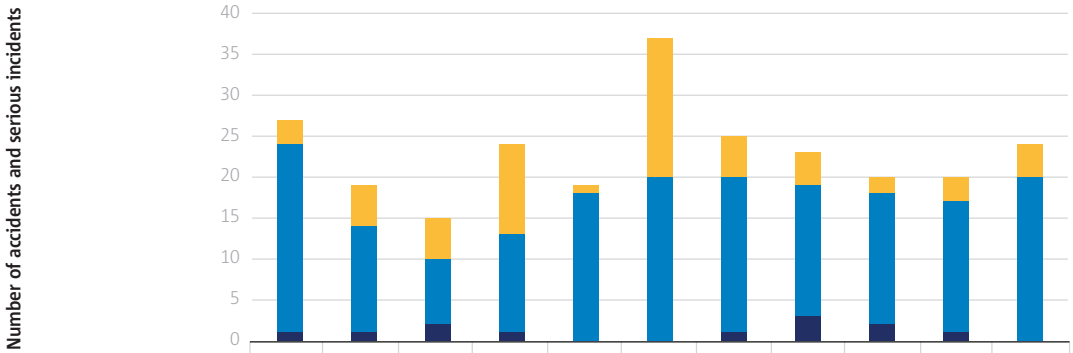
	Total number of occurrences per occurrence class over 2013-2022	Number of occurrences per occurrence class in 2023	Comparison 2023 vs yearly average of 2013-2022 per occurrence class
Fatal accidents	**12**	**0**	↓
Non-fatal accidents	**161**	**20**	↑
Serious incidents	**56**	**4**	↓

Table 4.1 Key statistics for balloons

	Number of fatalities	Number of serious injuries
Total number over 2013-2022	**12**	**176**
Yearly max number over 2013-2022	**3**	**24**
Yearly min number over 2013-2022	**0**	**10**
Total number in 2023	**0**	**18**

Table 4.2 Fatalities and serious injuries involving balloons

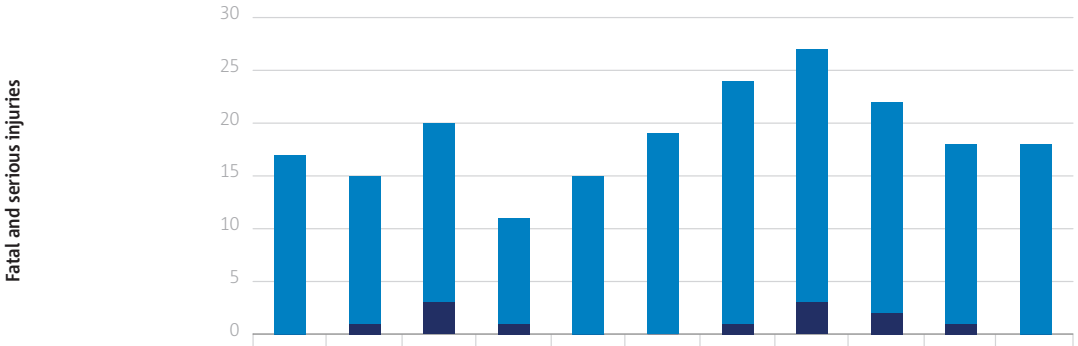
Figure 4.1 illustrates the trend in fatal accidents, non-fatal accidents, and serious incidents from 2013 to 2023. Notably, last year's data closely resembled that of 2019. Additionally, a slight upward trend in the overall figures can be observed in the year 2023 in comparison with 2022.



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Serious incidents	3	5	5	11	1	17	5	4	2	3	4
Non-fatal accidents	23	13	8	12	18	20	19	16	16	16	20
Fatal accidents	1	1	2	1	0	0	1	3	2	1	0

Figure 4.1 Fatal accidents, non-fatal accidents and serious incidents per year involving balloons

Figure 4.2 shows the number of fatalities and serious injuries in a similar upward trend as Figure 4.1. Last year 2023 can be compared to the year before and to 2018 in terms of serious injuries. Number of fatalities is zero in 2023, marking four years out of the previous 10 without loss of life in this domain.



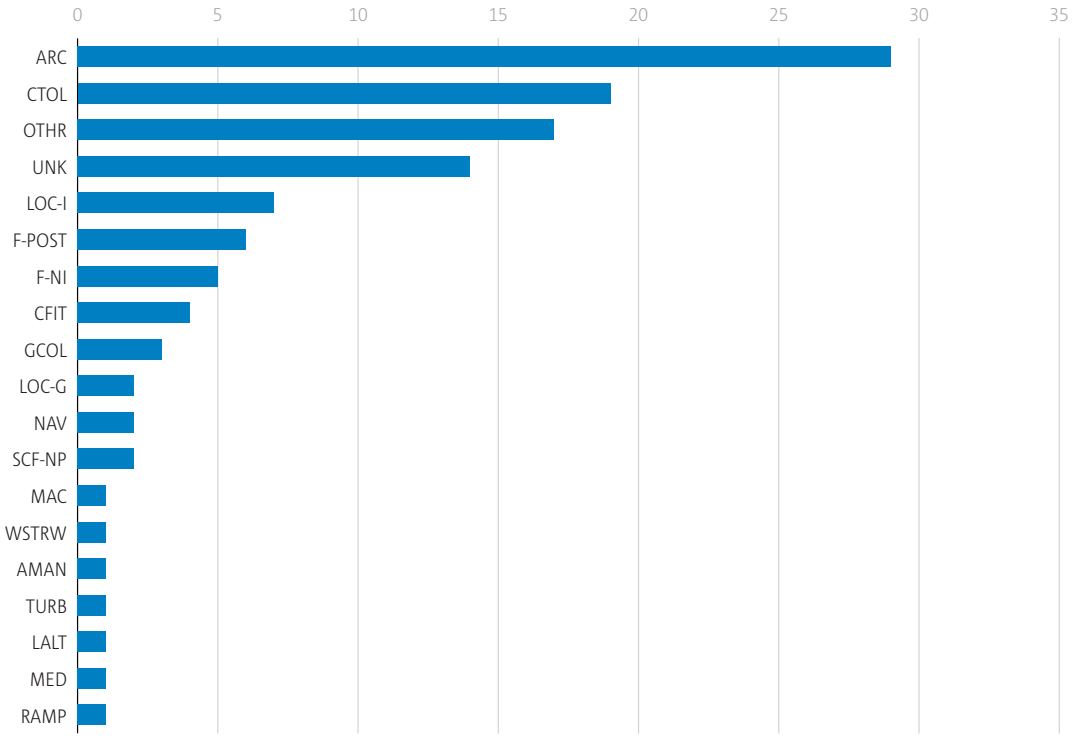
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Serious Injuries	17	14	17	10	15	19	23	24	20	17	18
Fatalities	0	1	3	1	0	0	1	3	2	1	0

Figure 4.2 Fatalities and serious injuries involving balloons

Occurrence categories

Figure 4.3 outlines the top 19 categories assigned to the serious incidents and accidents in the past five years. Occurrences are categorised using the ICAO Accident Incident Data Reporting (ADREP) taxonomy for occurrence categories, developed for supporting common coding of the main elements of an occurrence that should be investigated, recorded, and analysed. Categories are of different nature, e.g., operational such as abrupt manoeuvre (AMAN), environmental such as windshear or thunderstorm (WSTRW), technical such as system/component failure or malfunction [non-powerplant] (SCF-NP), consequential such as fire/smoke resulting from impact (F-POST), etc. Multiple categories may therefore be assigned to a single occurrence. For example, if an engine failure occurred and loss of control followed, the occurrence would be coded in both categories, i.e., SCF-PP: powerplant failure or malfunction and LOC-I: loss of control in flight. The sum of the number of occurrences per category may therefore be greater than the total number of occurrences realised in the period.

For the period 2019-2023 figures show that abnormal runway contact is the most common cause of injuries. This remains the same as in the previous ASR edition and means that hard landings are causing injuries, mostly to passengers, resulting in bone fractures or torn ligaments. The collision with obstacles during take-off or landing occurrence category includes collisions with powerlines, buildings, or other structures.

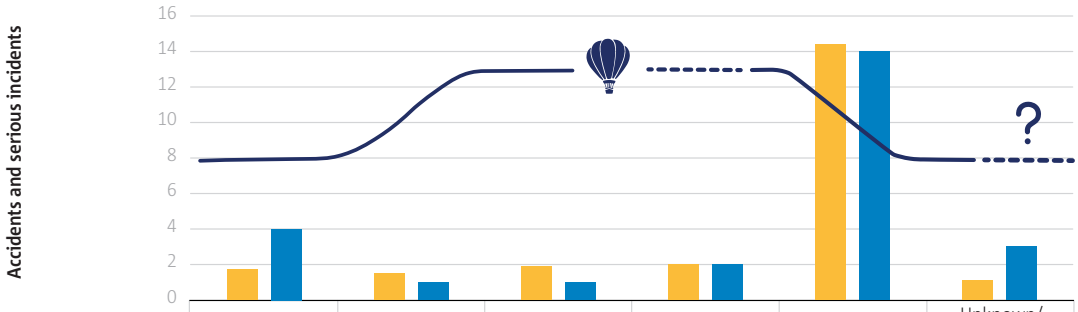


ARC: Abnormal runway contact; OTHR: Other; CTOL: Collision with obstacle(s) during take-off and landing; UNK: Unknown or undetermined; F-POST: Fire/smoke (post-impact); LOC-I: Loss of control - inflight; GCOL: Ground Collision; WSTRW: Windshear or thunderstorm; AMAN: Abrupt manoeuvre; F-NI: Fire/smoke (non-impact); CFIT: Controlled flight into or toward terrain; GCOL: Ground Collision; LOC-G: Loss of control - ground; NAV: Navigation error; SCF-NP: System/component failure or malfunction [non-powerplant]; TURB: Turbulence encounter; CABIN: Cabin safety events; LALT: Low altitude operations; MAC: Airprox/ACAS alert/loss of separation/(near) midair collisions; MED: Medical; RAMP: Ground Handling

Figure 4.3 Numbers of occurrences by occurrence category involving balloons

Phase of flight

Vast majority of balloon accidents and serious incidents remain occurring during the landing phase of the flight, as shown in Figure 4.4. It can also be observed that the number of recorded landing accidents and serious incidents is very slightly lower than the 10-year average. There is an increase in accidents and serious incidents during the standing flight phase, whilst for take-off and manoeuvring phases these numbers are decreasing. For balloons, the flight phase standing covers the period where the balloon is filled with hot air, but the basket is still heavy.

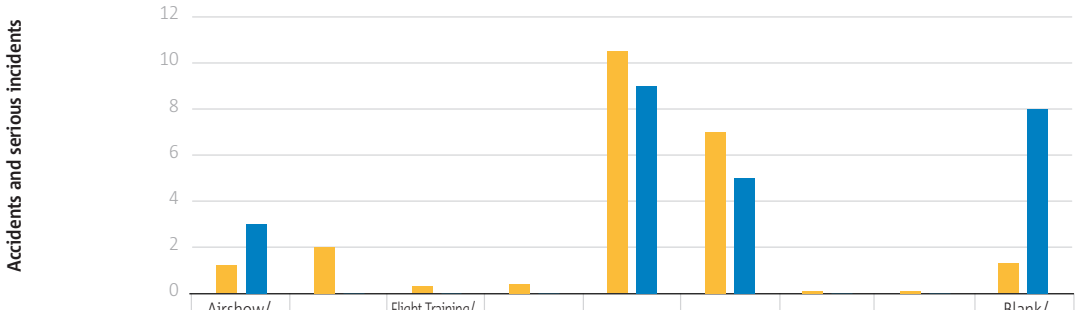


	Standing	Take-off	En route	Manoevring	Landing	Unknown/ Blank
Average 2013-2022	1.7	1.5	1.9	2	14.4	1.1
2023	4	1	1	2	14	3

Figure 4.4 Accidents and serious incidents involving balloons, by phase of flight

Operation type

Most balloon accidents and serious incidents are related to passenger and pleasure flights, as shown in Figure 4.5 with a decrease in 2023 compared with the 10-year average. Note that activities such as competitions and record flights are considered to be part of the airshow/race category and in the year 2023 there were more accidents and serious incidents in this category than in the 10-year average. There is a fairly stable and low number of accidents and serious incidents in all other categories. In 2023 no accidents and serious incidents were recorded in five out of nine categories as shown in the Figure 4.5, possibly at the expense of the notable increase in the number of blank/unknown operation type category.



	Airshow/ race	Business	Flight Training/ Instructional	Other	Passenger	Pleasure	Photography	Demonstration	Blank/ Unknown
Average 2013-2022	1.2	2	0.3	0.4	10.5	7	0.1	0.1	1.3
2023	3	0	0	0	9	5	0	0	8

Figure 4.5 Accidents and serious incidents involving balloons, by operation type