EASA
European Union Aviation Safety Agency

Chapter 3
Helicopters

ANNUAL SAFETY REVIEW
2025

This chapter covers all operations involving EASA certified or validated helicopters. The chapter is divided in four main sections:

- **All helicopter operations** providing aggregated statistics on EASA certified or validated helicopters performing Commercial air transport (CAT), Specialised operations (SPO) or Non-commercial operations (NCO), and for which an EASA Member State is either state of operator, state of registry or state of occurrence;
- **CAT flights** conducted by EASA AOC holders and using certified or validated helicopters. This section brings together CAT helicopter operations for both onshore and offshore flights and includes HEMS, air ambulance, air taxi or sightseeing, and those flights to offshore oil, gas and renewable energy installations;
- **SPO** involving certified or validated helicopters, such as sling load, advertisement, and photography with an EASA Member State as the state of operator or state of registry;
- **NCO** involving certified or validated helicopters, with an EASA Member State as the state of operator or state of registry. This section includes, particularly training flights.

The data presented are based on the accidents collected by the Agency under Regulation (EU) 996/2010 on accident and serious incident investigation and Regulation (EU) 376/2014 on occurrence reporting. This report is enhanced with compiled data gathered from operators, OEMs to build an overall safety picture for the helicopter operations.

For each section, the key statistics, occurrence categories and safety risks are presented in the core document. The overview of the safety risks is solely derived from occurrence data from the ECR. It is important to note that the fleet size data has been extracted from the Cirium[12] database regarding the total EASA Member State fleet for the period between 2020-2024.

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

12 Source: Cirium Fleets Analyzer. Extraction date: May 2025. Includes all civil (i.e., non-military and non-state) CS-27 and CS-29 rotorcraft that are operated by EASA Member State operators. EASA Type I rotorcraft are excluded. Cirium makes no warranties, express or implied, as to the accuracy, adequacy, timeliness, or completeness of its data or its fitness for any particular purpose. Cirium disclaims all liability relating to or fully arising out of use of its data and other content or permissible by law.

3.1 All helicopter operations

The scope of this section covers the key safety statistics for certified or validated helicopters performing CAT, SPO or NCO, for which an EASA Member State is either the state of operator, the state of registry or the state of occurrence.

Since these figures are not normalised with traffic data, the number of occurrences should be interpreted cautiously, as there is variation in the figures for the helicopter flying activity at the European level and is difficult to estimate the corresponding mission types and hours flown. The Rotorcraft community is currently taking action to address the recurrent challenge of assessing the level of helicopter flying activity in Europe by evaluating the option of a proxy of accident rate data, to consolidate fleet flying hours. We know that the information contained within this report can be improved: accuracy and fidelity can be enhanced; industry/NCAs intelligence can be expanded; further Information gathering, exchange and analysis can be performed to continuously develop this report.

Key statistics

The key statistics for this domain are in Table 3.1 and Table 3.2. It includes a comparison of the number of accidents (fatal and non-fatal) and serious incidents for the last year and the previous 10-year period. Similarly, a comparison of the fatalities and serious injuries sustained in those accidents during the same timeframe is also included.

In absolute numbers, 2024 shows an increase in non-fatal accidents and serious incidents compared to the average of the previous decade, while fatal accidents staying near the lowest level recorded in the past ten years.

	Total number of occurrences per occurrence class over 2014-2023	Number of occurrences per occurrence class in 2024	Comparison 2024 vs yearly average of 2014-2023 per occurrence class
Fatal accidents	**82**	**7**	↓
Non-fatal accidents	**353**	**37**	↑
Serious incidents	**144**	**38**	↑

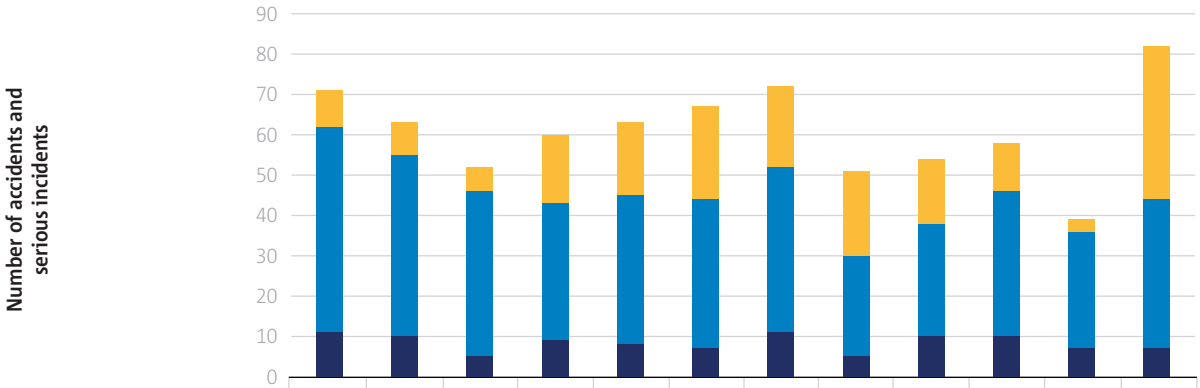
Table 3.1 Key statistics for all helicopter operations

	Number of fatalities	Number of serious injuries
Total number over 2014-2023	**191**	**109**
Yearly max number over 2014-2023	**37**	**19**
Yearly min number over 2014-2023	**9**	**5**
Total number in 2024	**14**	**14**

Table 3.2 Fatalities and serious injuries involving all helicopter operations

The graph below shows the distribution of fatal and non-fatal accidents over the period (Figure 3.1). In 2024, the total number of fatal accidents remained near the minimum, non-fatal accidents stayed close to the 10-year average, whereas serious incidents saw a notable increase.

In the last 5-year period (2020-2024) covered by this report, there were 75 fatalities in the identified accidents. Considering all accidents (fatal and non-fatal) gives a mean fatality rate of 0.38 fatalities per accident. Considering only fatal accidents, the mean fatality rate becomes 2 fatalities per accident.

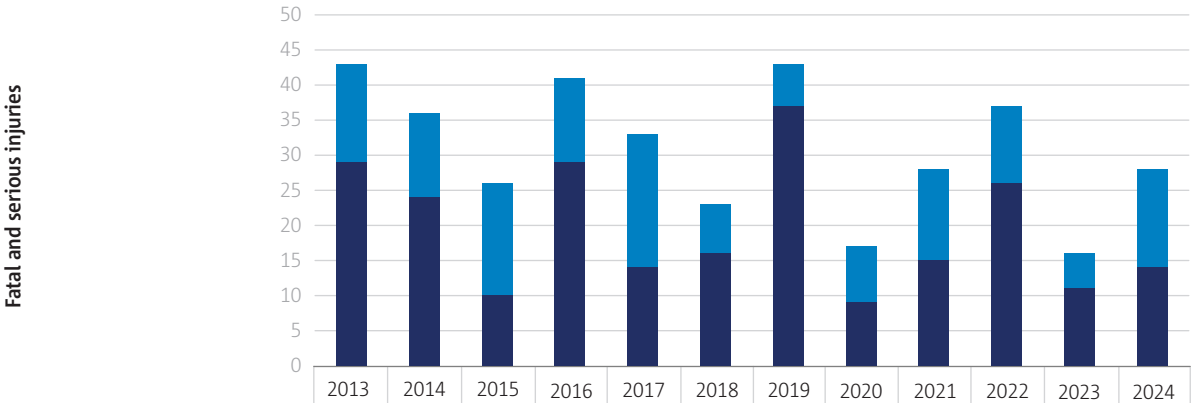


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious incidents	9	8	6	17	18	23	20	21	16	12	3	38
Non-fatal accidents	51	45	41	34	37	37	41	25	28	36	29	37
Fatal accidents	11	10	5	9	8	7	11	5	10	10	7	7

Figure 3.1 Fatal accidents, non-fatal accidents and serious incidents per year involving all helicopter operations

The Figure 3.1 shows the occurrence number totals, split between fatal and non-fatal and serious incidents.

In 2024, there was a slight increase in the number of fatalities, while serious injuries experienced a noticeable increase.

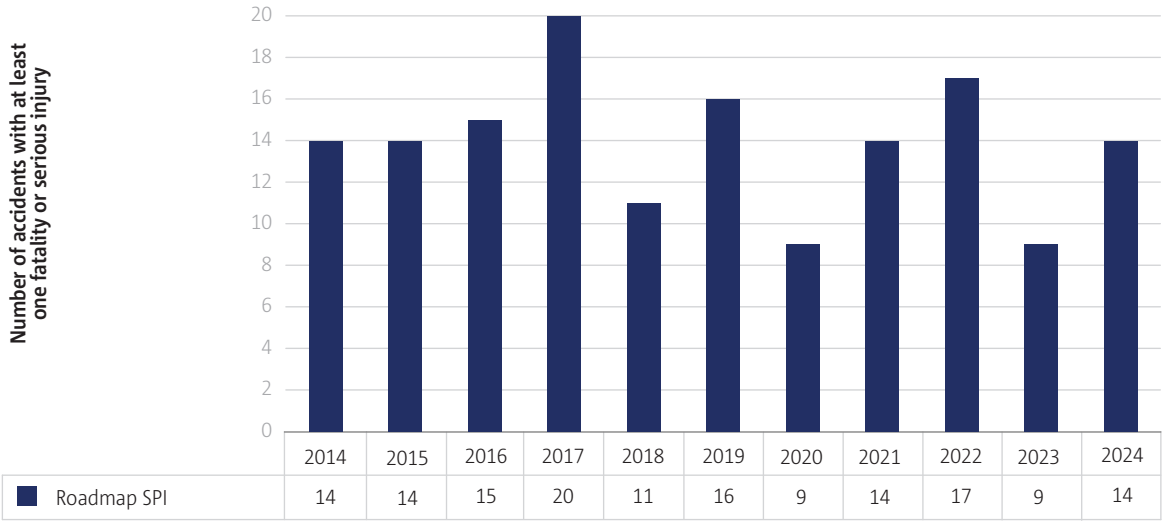


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious Injuries	14	12	16	12	19	7	6	8	13	11	5	14
Fatalities	29	24	10	29	14	16	37	9	15	26	11	14

Figure 3.2 Fatal and serious injuries per year involving all helicopter operations

Rotorcraft safety roadmap Safety Performance Indicator (SPI)

The safety performance of the Rotorcraft safety roadmap is measured by a series of metrics , one of those is to continually reduce fatalities and injuries, and to achieve a continuous reduction of operational safety risks. The Safety Performance Indicator (SPI) is used to monitor the and understand the safety performance as we progress to sustain a positive trend. As part of the Rotorcraft Roadmap, safety is a continuous work that addresses transversal issues and and encompasses training, operations, as well initial and continuing airworthiness. Initiatives with operators and manufacturers aim to prioritise risk detection and identify which activities require strong support through both training and operational updates.



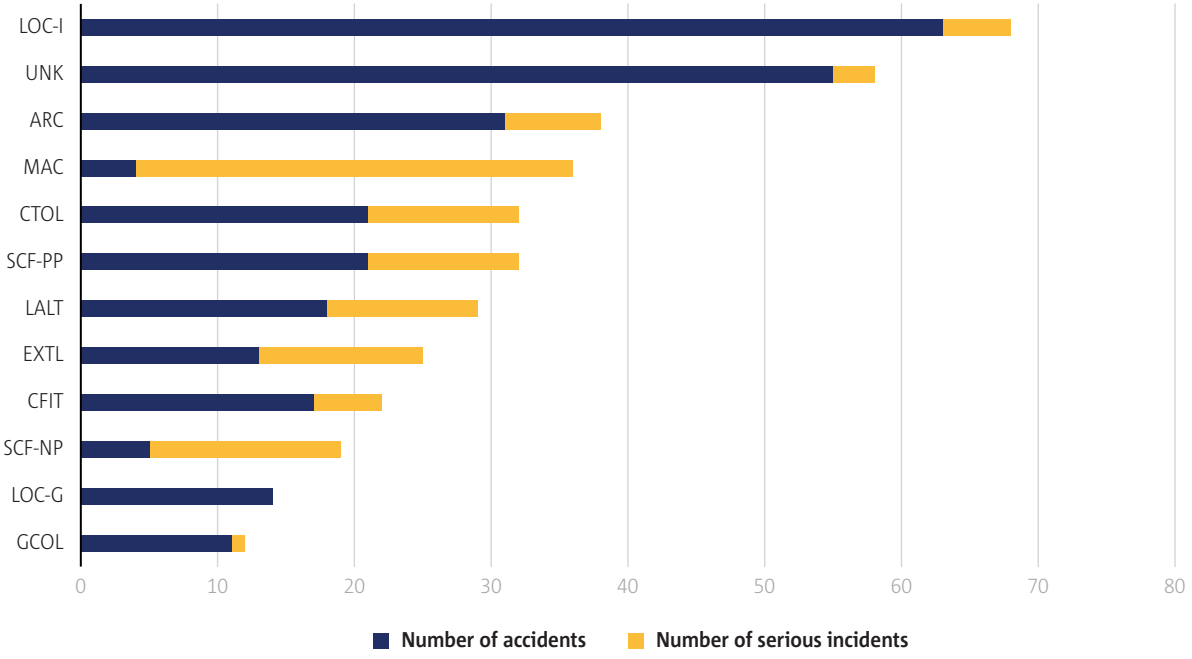
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Roadmap SPI	14	14	15	20	11	16	9	14	17	9	14

Figure 3.3 Number of accidents and serious incidents with a least one fatality or serious injury for all helicopter operations

Occurrence categories

Figure 3.4 shows the breakdown of all accidents by ICAO ADREP taxonomy over the 5-year period by type of occurrence class.

The CAST/ICAO Common Taxonomy Team (CICTT) provides definitions for aviation occurrence categories. For each of the accidents, where possible, one or more occurrence categories were allocated. In some cases, more than one occurrence category is applied to a single accident. Categories are of different natures, e.g., operational such as low altitude operations (LALT), environmental such as turbulence encounter (TURB), technical such as system/ component failure or malfunction [non-powerplant] (SCF-NP), consequential such as fire/smoke resulting from impact (F-POST), etc. The sum of the number of occurrences per category may therefore be greater than the total number of occurrences that were realised in the period.



LOC-I: Loss of control – inflight; UNK: Unknown or undetermined; ARC: Abnormal runway contact; MAC: Airprox/ACAS alert/loss of separation/ (near) midair collisions; CTOL: Collision with obstacle(s) during take-off and landing; SCF-PP: powerplant failure or malfunction; LALT: Low altitude operations; EXTL: External load related occurrences; CFIT: Controlled flight into or toward terrain; SCF-NP: System/component failure or malfunction [non-powerplant]; LOC-G: Loss of control – ground; GCOL: Ground Collision

Figure 3.4 Numbers of accidents and serious incidents by occurrence category and occurrence class for all helicopter operations

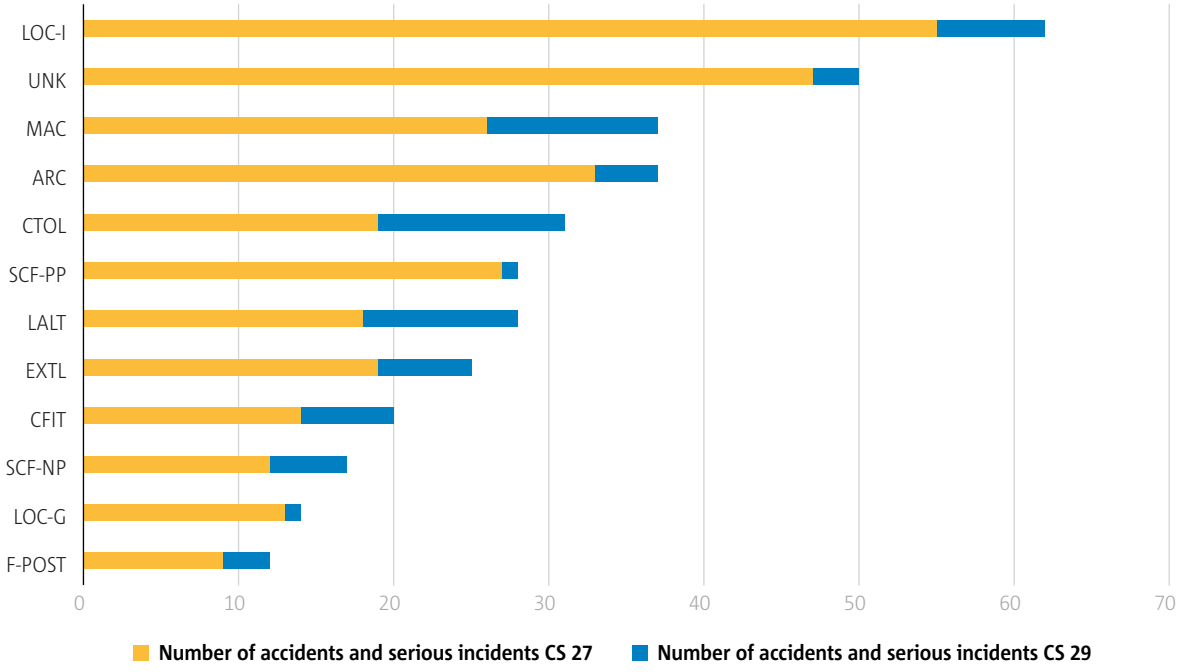
In the last five years covered by this dataset (2020-2024), the three most common occurrence categories accidents (fatal and non-fatal) were: loss of control in flight (LOC-I); abnormal runway contact (ARC), collision with obstacle(s) (CTOL).

Including serious incidents we have these five grouping: MAC, ARC, CTOL, SCF-PP, LALT, account for nearly same total number of accidents and serious incidents.

The occurrence category UNK: unknown is the second high-risk accident occurrence category which appears in the figures. This may be the result of the investigation process and reporting where mapping occurrence categories can take a certain amount of time. The UNK category here contains 17%. The quality of reporting the safety occurrences is in important factor to understand the true safety performance of the industry and measure improvements as we progress towards our goal of zero fatal accidents and that reporting organisations and competent authorities continue their effort to improve the coding quality of occurrence records submitted under Regulation (EU) 376/2014.

The data presented highlight the importance of the Data4Safety Programme and the benefits of sharing data; with focus on the development of automation algorithms applied to occurrence information, to support the coding of fields such as the Occurrence Category values and reduce the proportion of "Unknown" values. By collaborating we can better understand the safety performance of the helicopter operations and measure the improvements as we progress towards.

The Figure 3.5 shows the breakdown of all accidents by ICAO ADREP taxonomy over the 5-year by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29).



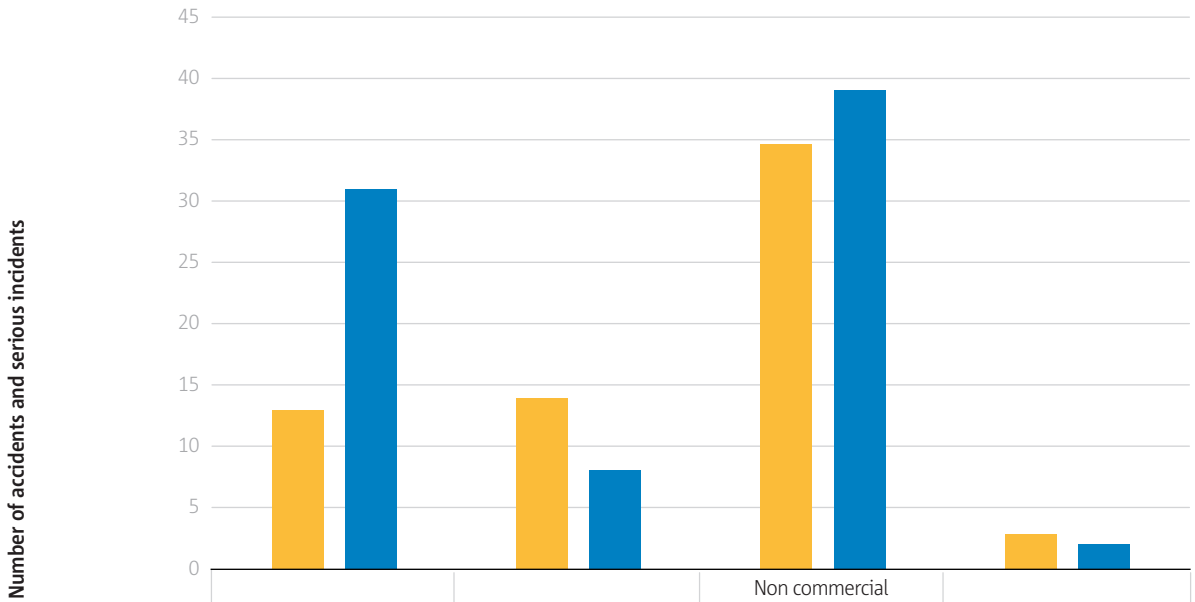
LOC-I: Loss of control – inflight; UNK: Unknown or undetermined; MAC: Airprox/ACAS alert/loss of separation/(near) midair collisions; ARC: Abnormal runway contact; CTOL: Collision with obstacle(s) during take-off and landing; SCF-PP: powerplant failure or malfunction; LALT: Low altitude operations; EXTL: External load-related occurrences; CFIT: Controlled flight into or toward terrain; SCF-NP: System/component failure or malfunction [non-powerplant; LOC-G: Loss of control – ground;;] F-POST: Fire/smoke (post-impact);

Figure 3.5 Numbers of accidents and serious incidents by occurrence category and aircraft certification type for all helicopter operations

Helicopter operations sub-domains

Figure 3.6 shows the numbers of accidents for the four main sub-domains of operations involving certified and validated helicopters. Over the decade 2014-2023, the proportions of each domain are the following:

- 53.1% of all accidents and serious incidents involved certified and validated helicopters performing non-commercial operations and for which an EASA Member State was either the state of operator or state of registry;
- 21.3% of all accidents and serious incidents involved certified and validated helicopters performing SPO and for which an EASA Member State was either the state of operator or state of registry;
- 19.8% of all accidents and serious incidents involved certified and validated helicopters performing CAT conducted by EASA Member State AOC holders;
- 2% of all accidents and serious incidents involved certified helicopters whose state of operator and state of registry were a third country but for which the state of occurrence was an EASA Member State.

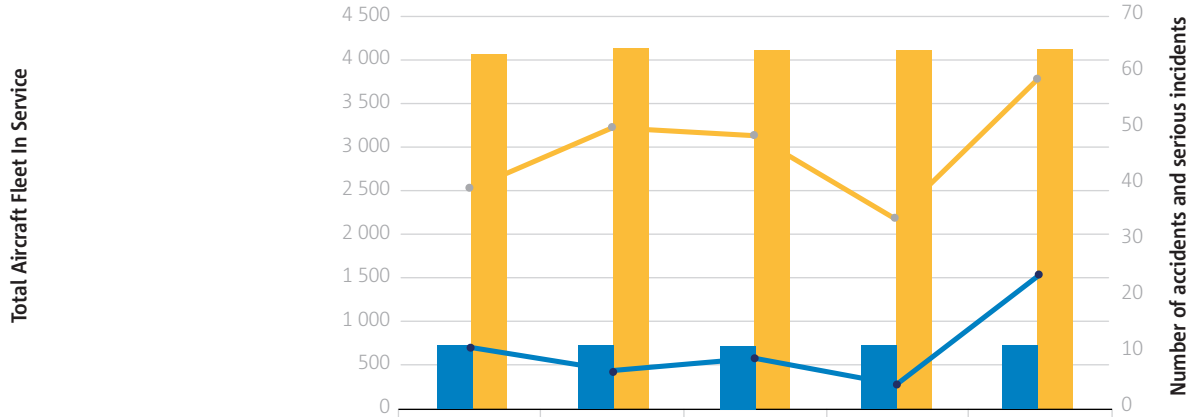


	CAT - EASA MS AoC holder	SPO - EASA MS operated or registered	Non commercial - EASA MS operated or registered	Third country registered
Average 2014-2023	12.9	13.9	34.6	2.8
2024	31	8	39	2

Figure 3.6 Accidents and serious incidents by helicopter operation sub-domains

Type of certified helicopter (CS27/CS29)

Figure 3.7 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29), with a trendline of accidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas the total number of accidents in each period is shown in the secondary vertical axis.



	2020	2021	2022	2023	2024
CS 29 Total In Service	731	731	724	734	734
CS 27 Total In Service	4 076	4 136	4 121	4 117	4 126
CS 29 Accidents and Serious incidents	11	6	9	4	24
CS 27 Accidents and Serious incidents	39	50	49	34	58

Figure 3.7 Accidents and serious incidents by certification specification for all helicopter operations with the breakdown of aircraft certification type for the reported fleet

Safety risks

The safety risks identified hereafter are derived from occurrences data recorded in the ECR, covering the two-year period of 2023-2024. With an average of approximately 1950 occurrences per year, 2100 were completed with an ERCS safety risk score, resulting a 52% ERCS completion rate for the domain.

When considering only accidents and serious incidents, the ERCS completion rate for the domain rises to 85%.

The relative comparison between KRAs for this domain is highlighted in Figure 3.8. KRAs and occurrence categories (refer to core document Figure 3.4) have different purposes. While occurrence categories describe actual factors and outcomes of an occurrence, KRAs describe the potential outcome of an occurrence. The KRA is defined by the most likely type of accident that an occurrence could have escalated to. Unlike occurrence categories, where multiple categories may be assigned to a single occurrence, there can only be one KRA per occurrence. The KRA is one element of the ERCS. This scheme is applied when determining the safety risk score of an occurrence and is further detailed in the ASR introduction.

In the visual below you can see the top KRAs with the higher-risk KRAs being:

- **Aircraft upset (loss of control)** includes an undesired aircraft state characterised by unintentional divergences from parameters normally experienced during operations, which might ultimately lead to an uncontrolled impact with terrain. It remains a critical KRA of helicopter occurrence, particularly concerning due to their potentially severe consequences, emphasising the critical need for comprehensive safety measures and preventive strategies within the aviation industry. Various factors contribute to aircraft upset. These factors can range from engine failures, adverse weather conditions, maintenance events, or HP deficiencies such as, but not limited to; inappropriate energy management, inappropriate automation management, spatial disorientation, weakness in monitoring, etc. Managing an event like this requires pilots to use their technical and non-technical competencies to best effect to maximize resilience and minimize the possibility and effect of surprise.
- **Airborne collision** includes all occurrences involving actual or potential airborne collisions between aircraft, while both aircraft are airborne and between aircraft and other airborne objects (excluding birds and wildlife). Despite accounting for a relatively small percentage of ERCS equivalent weight, over the past year, airborne collision is a significant contributor to occurrences. The statistics highlight the importance for both manned and unmanned aircraft operated by aviation professionals to recognise this threat and develop skills on how to scan for traffic conflicts.
- **Terrain collision (CFIT)** includes occurrences where an aircraft collides with terrain, without indication that the flight crew was unable to control the aircraft. Analysing data for the last year, terrain collision is not the most frequent outcome of accidents but when looking at the ERCS score it has the highest ERCS equivalent weight. Today, accident data shows that terrain collision occurrences are much lower.

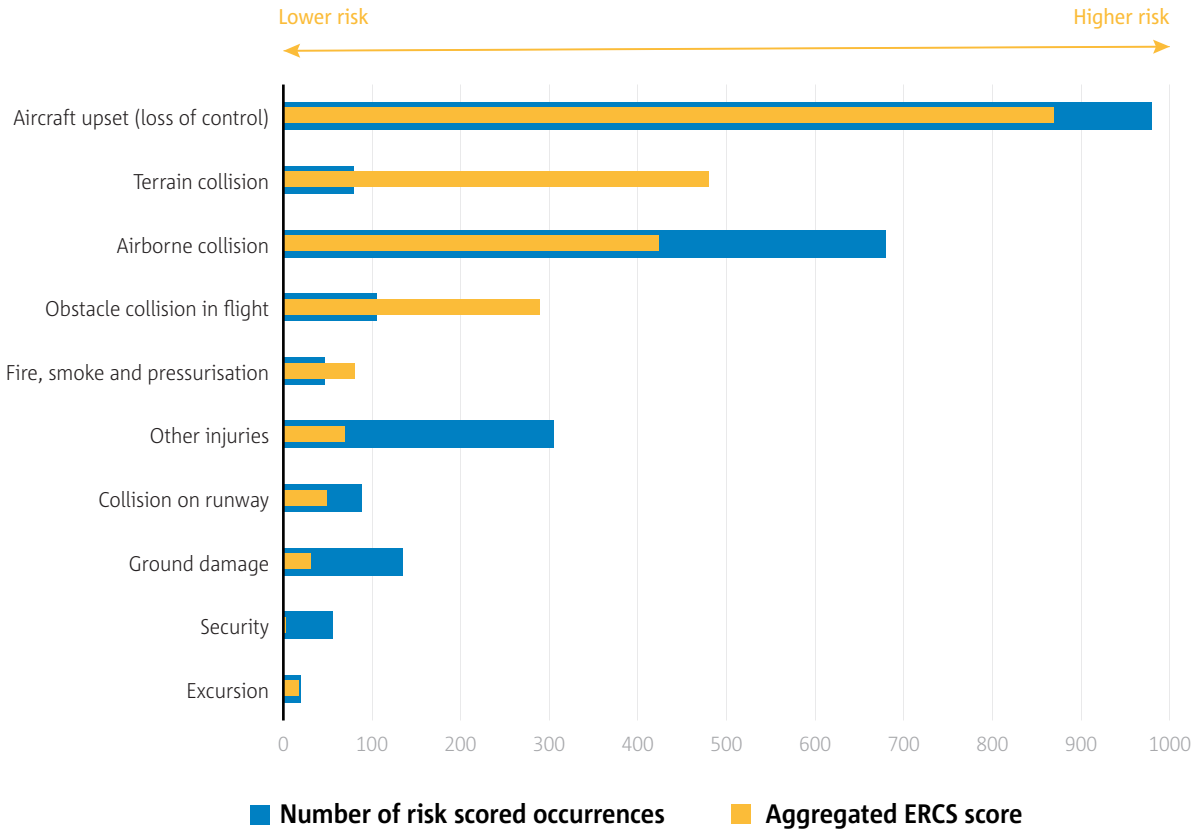


Figure 3.8 KRAs by aggregated ERCS score and number of risk-scored occurrences involving all helicopter operations

3.2 Commercial air transport (CAT) helicopters

This section presents the key safety statistics for EASA certified or validated helicopters performing CAT and operated by an EASA Member State AOC holder. This includes offshore flights, as well as onshore HEMS, air ambulance, sightseeing tours, air taxis or any other operation to transport passengers, cargo or mail for remuneration or other valuable consideration.

European CAT helicopter fleet

Figure 3.9 and Figure 3.10 show the size of the helicopter CAT sector in the EASA Member State and its evolution over the period 2020-2024.

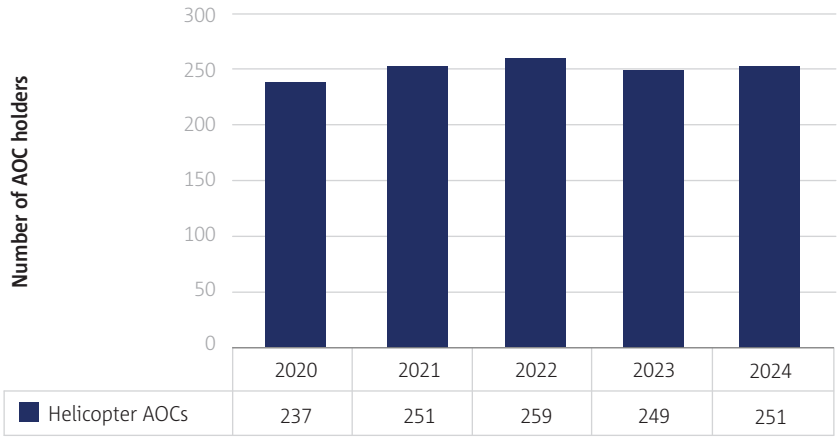


Figure 3.9 Number of helicopter AOC holders in the EASA Member States

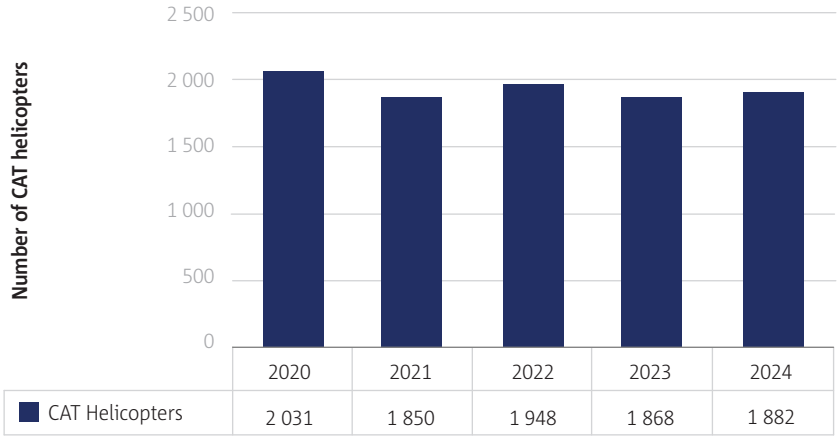


Figure 3.10 Number of helicopters performing CAT in the EASA Member States

Key statistics

The key statistics for this domain are in Table 3.3 and Table 3.4, which includes 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.

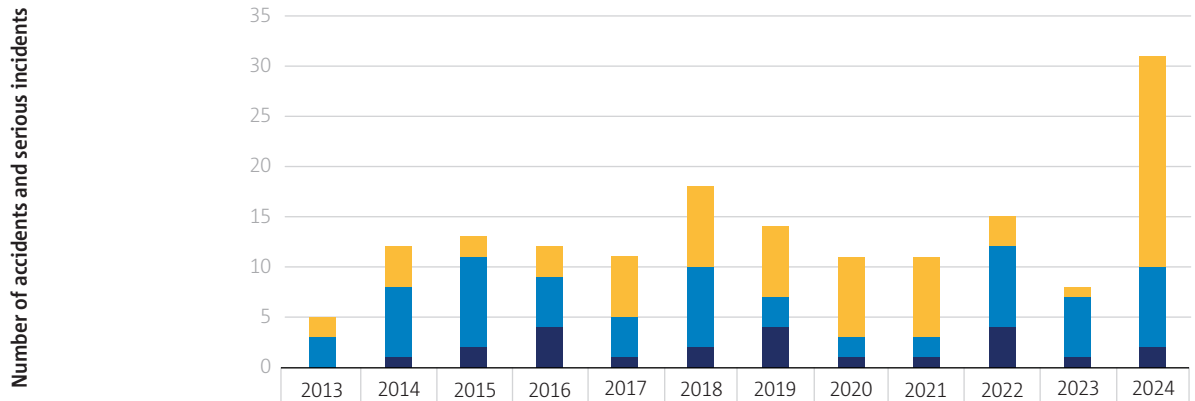
	Total number of occurrences per occurrence class over 2014-2023	Number of occurrences per occurrence class in 2024	Comparison 2024 vs yearly average of 2014-2023 per occurrence class
Fatal accidents	**21**	**2**	=
Non-fatal accidents	**54**	**8**	↑
Serious incidents	**50**	**21**	↑

Table 3.3 Key Statistics for CAT helicopters

	Number of fatalities	Number of serious injuries
Total number over 2014-2023	**93**	**20**
Yearly max number over 2014-2023	**27**	**7**
Yearly min number over 2014-2023	**1**	**0**
Total number in 2024	**4**	**6**

Table 3.4 Fatalities and serious injuries involving CAT helicopters

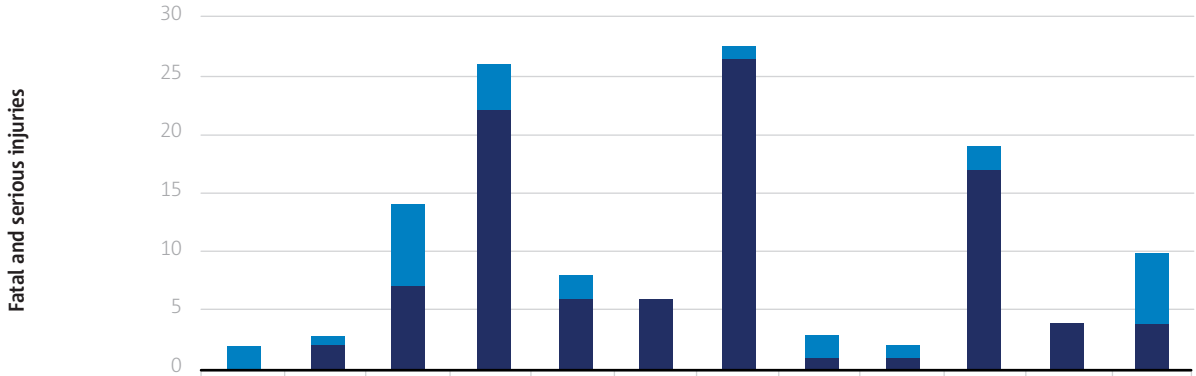
The total number of occurrences in 2024 shows an upward trend compared to the average of the past decade, with a notable rise in serious incidents, reaching the highest level in the last 10-years.



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious incidents	2	4	2	3	6	8	7	8	8	3	1	21
Non-fatal accidents	3	7	9	5	4	8	3	2	2	8	6	8
Fatal accidents	0	1	2	4	1	2	4	1	1	4	1	2

Figure 3.11 Fatal accidents, non-fatal accidents and serious incidents per year involving CAT helicopters

The figure below shows the 10-year occurrence number totals, split between fatal fatalities and serious injuries. To further analyse, the number of serious injuries in 2024 is at its highest point; however, the total remains limited to just 3 occurrences. This is specific to commercial operations, which on average carry a higher number of passengers compared to other types of operations.

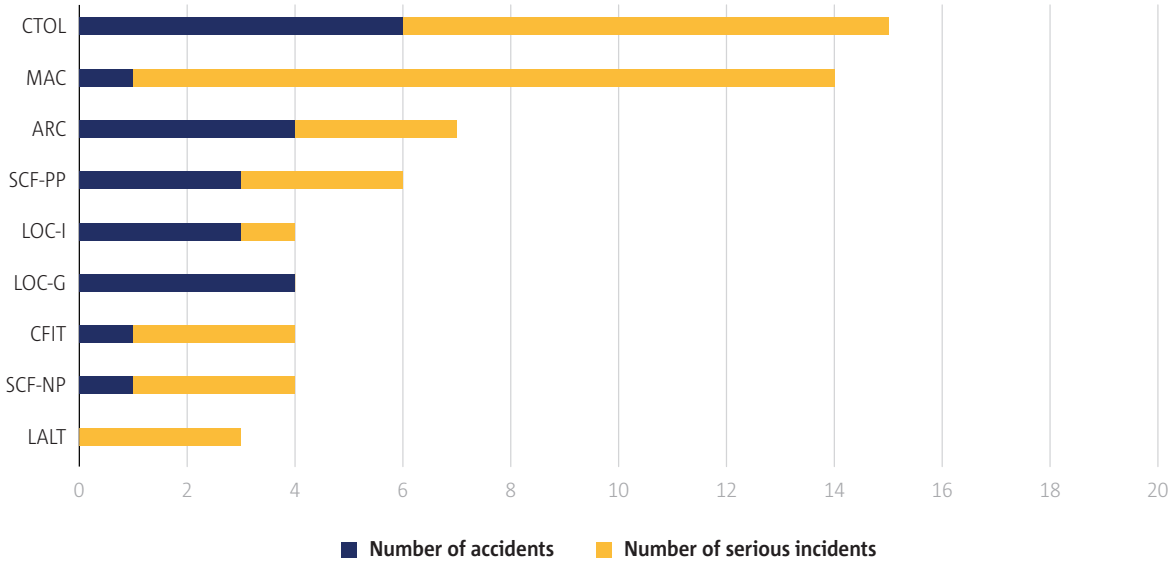


	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious Injuries	2	1	7	4	2	0	1	2	1	2	0	6
Fatalities	0	2	7	22	6	6	27	1	1	17	4	4

Figure 3.12 Fatal and serious injuries per year involving CAT helicopters

Occurrence categories

Figure 3.13 outlines the top occurrence categories assigned to the accidents in the past five years.



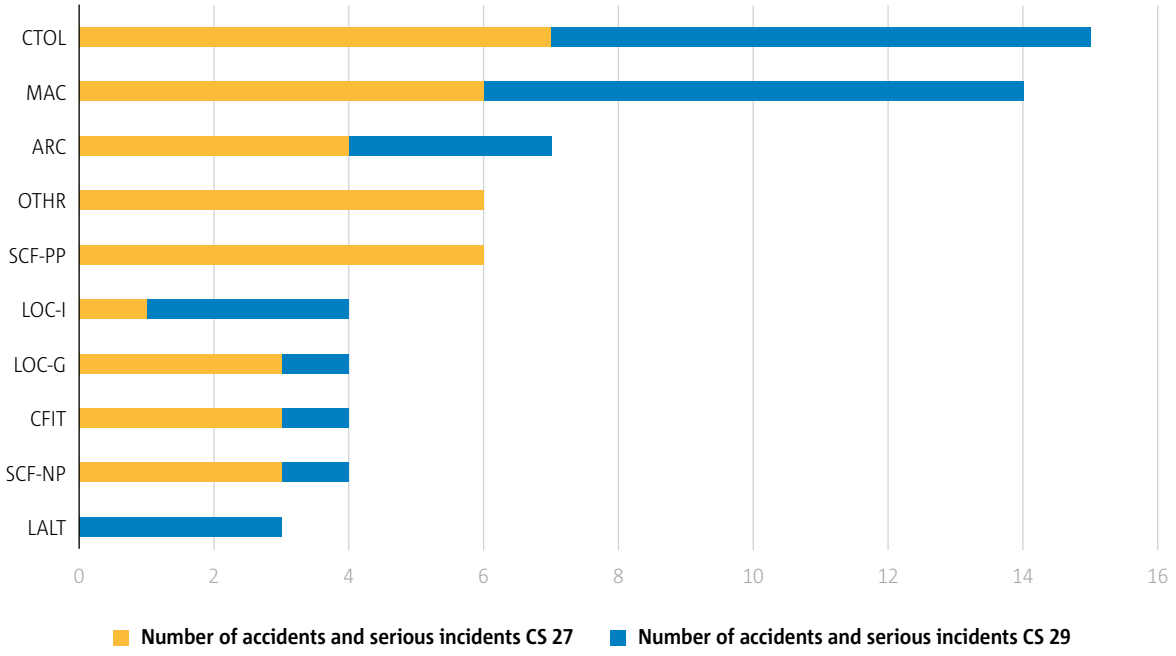
CTOL: Collision with obstacle(s) during take-off and landing; MAC: Airprox/ACAS alert/loss of separation/(near) midair collisions; ARC: Abnormal runway contact; SCF-PP: powerplant failure or malfunction; LOC-I: Loss of control – inflight; LOC-G: Loss of control – ground; CFIT: Controlled flight into or toward terrain; SCF-NP: System/component failure or malfunction [non-powerplant]; LALT: Low altitude operations

Figure 3.13 Numbers of accidents and serious incidents by occurrence category and occurrence class involving CAT helicopters

Occurrences are categorised using the ICAO ADREP taxonomy for occurrence categories, developed for supporting common coding of the main elements of an occurrence that should be investigated, recorded, and analysed.

Based on the analysis , the three most common occurrence categories associated with all accidents involving CAT helicopters over 2020-2024 are: CTOL: Collision with obstacle(s) during take-off and landing with a high number of serious incidents in 2024; Airprox/ACAS alert/loss of separation/(near) midair collisions remains high exposed in commercial operations with a increased number in reported serious incidents, followed by ARC: Abnormal runway contact.

The Figure 3.14 shows the breakdown of all accidents by ICAO ADREP taxonomy over the 5-year by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29).

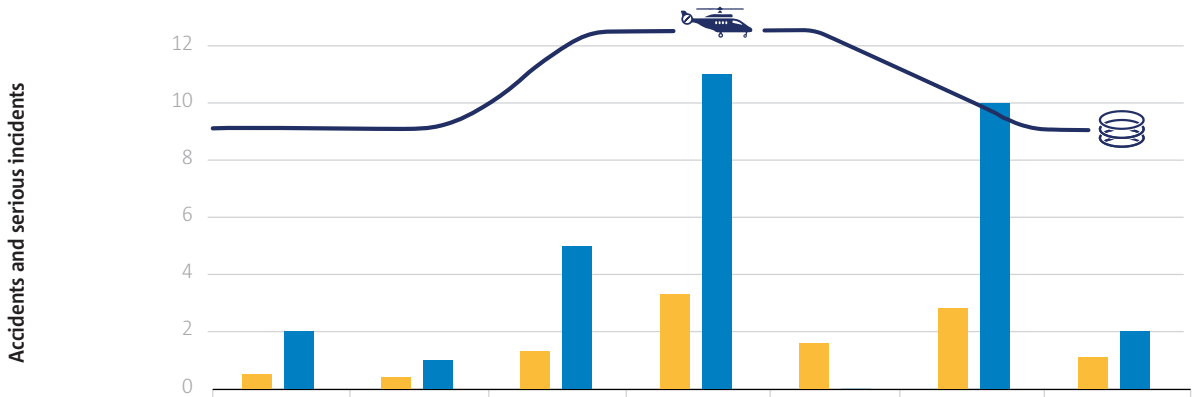


CTOL: Collision with obstacle(s) during take-off and landing; MAC: Airprox/ACAS alert/loss of separation/(near) midair collisions; ARC: Abnormal runway contact; OTHR: Other; SCF-PP: powerplant failure or malfunction; LOC-I: Loss of control – inflight; LOC-G: Loss of control – ground; CFIT: Controlled flight into or toward terrain; SCF-NP: System/component failure or malfunction [non-powerplant]; LALT: Low altitude operations

Figure 3.14 Numbers of accidents and serious incidents by occurrence category and aircraft certification type involving CAT helicopters

Phase of flight

Figure 3.15 shows the distribution of accidents by flight phase. Over the decade 2014-2023, the en-route phase and landing phase are the most involved in accidents. In 2024, the same trend continues, with 21 out of 31 occurrences taking place during the en-route or landing phases of flight.

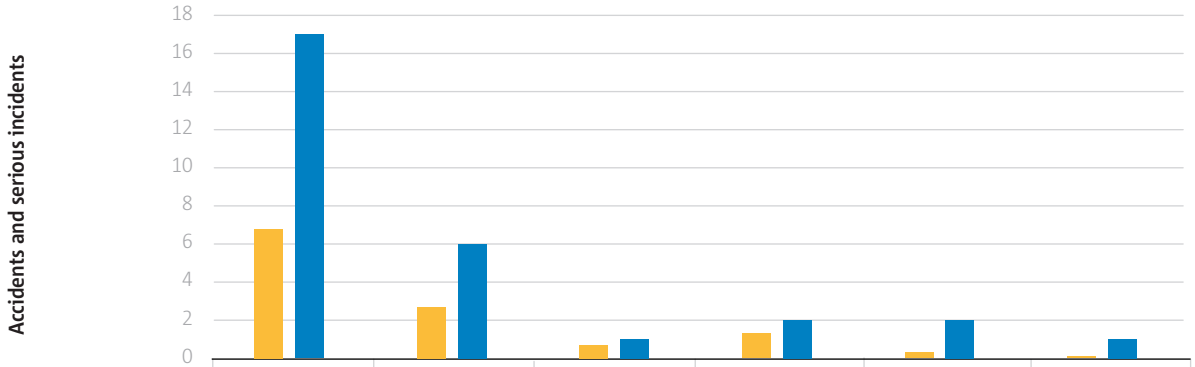


	Standing	Taxi	Take-off	En route	Approach	Landing	Manoeuvring
Average 2014-2023	0.5	0.4	1.3	3.3	1.6	2.8	1.1
2024	2	1	5	11	0	10	2

Figure 3.15 Accidents and serious incidents by phase of flight involving CAT helicopters

Operation type

Figure 3.16 shows the number of accidents and serious incidents per sub-type of operations. With a total of 21 occurrences for this operational type, six accidents and 15 serious incidents in 2024, the figures involving HEMS and Air Ambulance operations showed a significant increase of more than half compared to the average figures of the preceding decade for this type of operation. It showed a similar upward trend in Air Taxi operations.

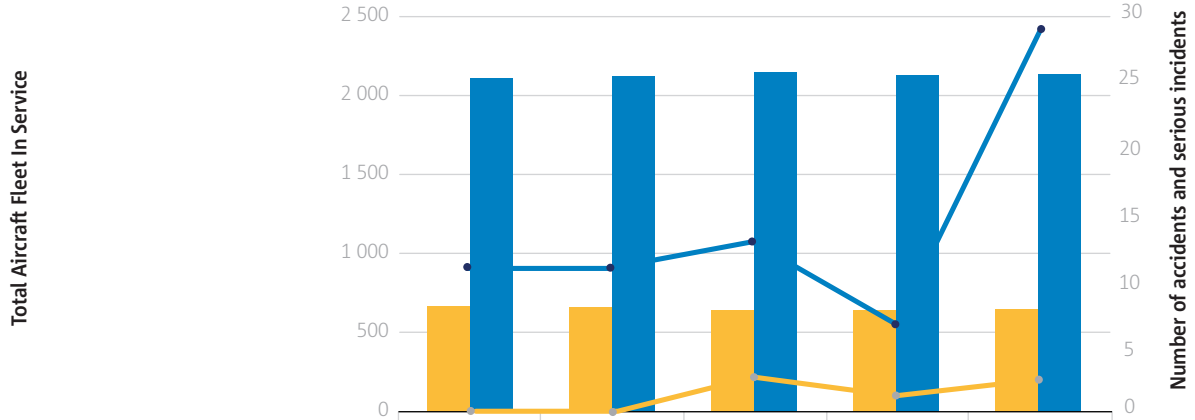


	HEMS	Air Taxi	Offshore	Sightseeing	Air Ambulance	Airline
Average 2014-2023	6.8	2.7	0.7	1.3	0.3	0.1
2024	17	6	1	2	2	1

Figure 3.16 Accidents and serious incidents by operation type involving CAT helicopters

Propulsion type

Figure 3.17 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of propulsion and with a trendline of accidents and serious incidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas the total number of accidents and serious incidents in each period is shown in the secondary vertical axis.

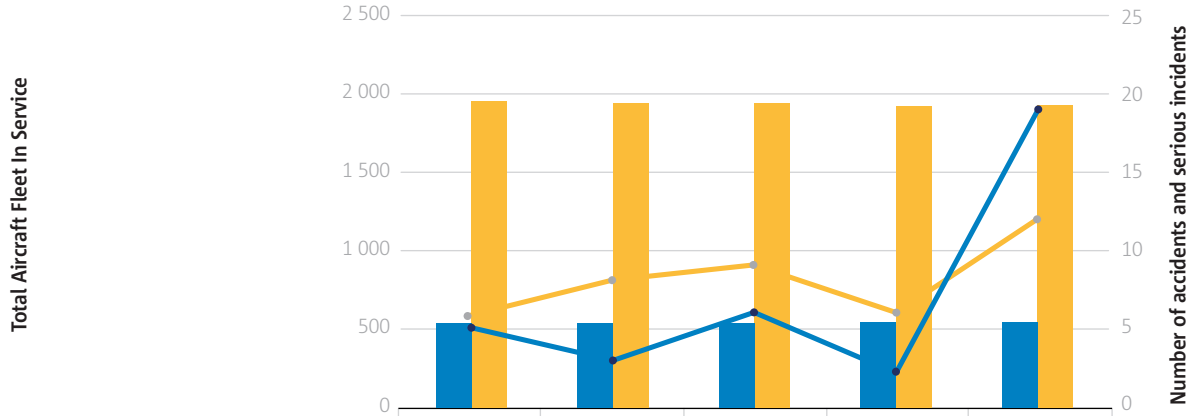


	2020	2021	2022	2023	2024
Reciprocating Total In Service	666	658	645	645	650
Turboshaft Total In Service	2 109	2 127	2 152	2 133	2 137
Reciprocating Accidents and Serious incidents	0	0	2	1	2
Turboshaft Accidents and Serious incidents	11	11	13	7	29

Figure 3.17 Accidents and serious incidents by propulsion type involving CAT helicopters with the breakdown of propulsion type for the reported fleet

Helicopter certification specification (CS27/ CS29)

Figure 3.18 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of certification specification and with a trendline of accidents and serious incidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas the total number of accidents and serious incidents in each period is shown in the secondary vertical axis. The relationship between certification and CAT operation requirements for transport category rotorcraft is acknowledged to be convoluted due to the diversity of mission types and their applicability to commercial operations. Through this analysis, it becomes evident that the large rotorcraft fleet based on CS 29 certification standards is more exposed compared to the fleet of small rotorcraft based on CS 27 standards.



	2020	2021	2022	2023	2024
CS 29 Total In Service	538	542	536	545	548
CS 27 Total In Service	1 957	1 942	1 945	1 922	1 932
CS 29 Accidents and Serious incidents	5	3	6	2	19
CS 27 Accidents and Serious incidents	6	8	9	6	12

Figure 3.18 Accidents and serious incidents by certification specification (CS27/CS29) for CAT operations with the breakdown of aircraft certification type for the reported fleet

Safety risks

The safety risks for CAT helicopters are derived from occurrences data recorded in the ECR, covering the two-year period 2023-2024.

With an average of approximately 1070 occurrences per year, 1510 were completed with an ERCS safety risk score, resulting a 70% ERCS completion rate for the domain.

When considering only accidents and serious incidents, the ERCS completion rate for the domain rises to 88%.

The relative comparison between KRAs for this domain is highlighted in Figure 3.19. KRAs and occurrence categories (refer to core document Figure 3.13) have different purposes. While occurrence categories describe actual factors and outcomes of an occurrence, KRAs describe the potential outcome of an occurrence. The KRA is defined by the most likely type of accident that an occurrence could have escalated to. Unlike occurrence categories, where multiple categories may be assigned to a single occurrence, there can only be one KRA per

occurrence. The KRA is one element of the ERCS. This scheme is applied when determining the safety risk score of an occurrence and is further detailed in the ASR introduction 3.19.

Aircraft upset remains the main KRAs of the CAT helicopters domain.

The KRAs of Terrain Collision and Fire, Smoke, and Pressurisation recorded fatal accidents during the 2023–2024 analysis period, elevating their risk levels into the top three.

Due to the nature of their activity, the special equipment required and the conditions they get flown in, such as flying at low altitudes and in challenging weather conditions, to reach patients in remote or inaccessible areas, CAT helicopters are exposed to operational and environmental threats.

The aggregated ERCS score shows that airborne collision ranks as the second highest key risk area. This statistic is a strong reminder of the dangers of airborne collision, highlighting the importance of taking the necessary precautions to avoid such a catastrophic event. It serves as a warning to pilots and other aircraft operators to be extra vigilant when flying in the vicinity of other aircraft. Furthermore, it emphasises the need for improved safety protocols and regulations to reduce the risk of aircraft collisions. With common sense and strict adherence to rules and regulations will prevent further accidents.

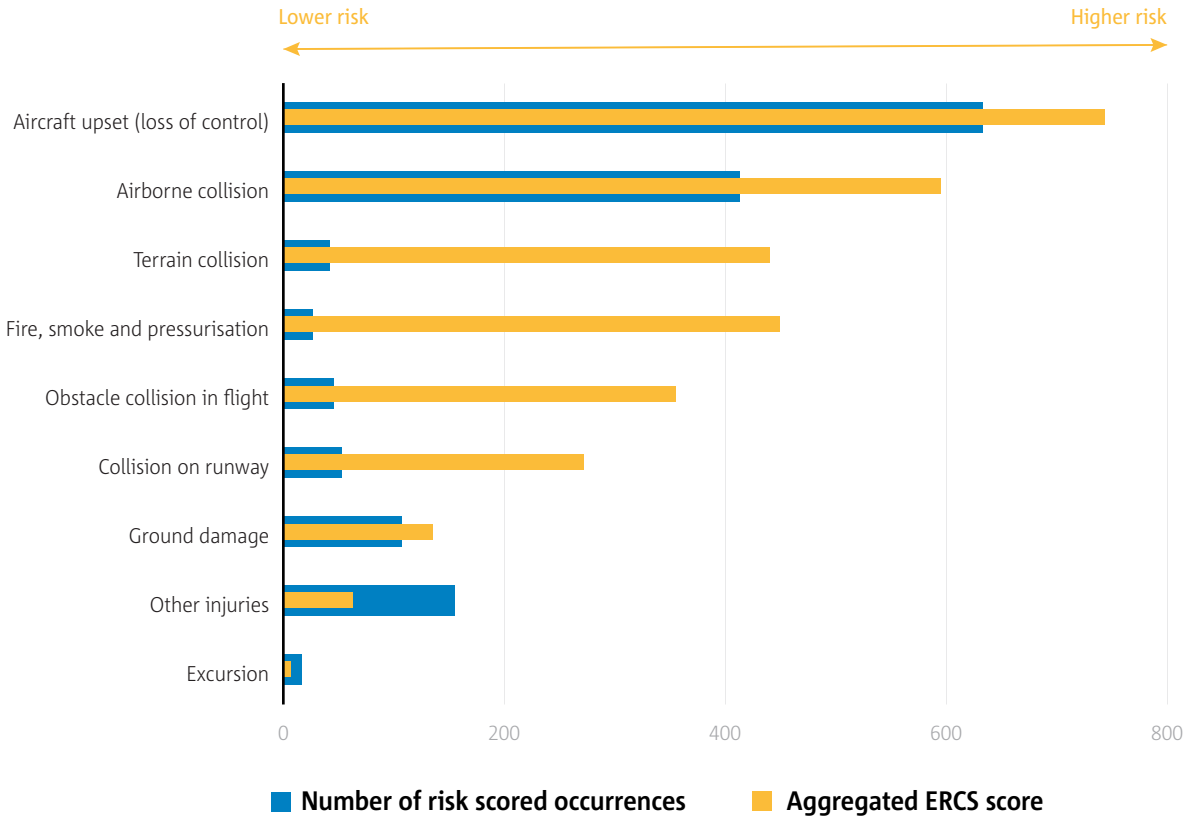


Figure 3.19 KRAs by aggregated ERCS score and number of risk-scored occurrences involving CAT helicopters

3.3 Specialised Operations (SPO) helicopters

This section presents the main safety statistics for EASA certified or validated helicopters performing SPO with an EASA Member State as state of operator or state of registry. SPO are defined as any operation other than CAT where the aircraft is used for specialised activities such as: agriculture, construction, photography, surveying, observation and patrol, aerial advertisement.

Key statistics

The key statistics for this domain are in Table 3.5 and Table 3.6, which include a comparison of the number of fatal and non-fatal accidents 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.

In 2024, there was a slight increase in the number of serious incidents compared to the previous year, while the occurrences of non-fatal accidents and fatal accidents remained at their lowest levels.

	Total number of occurrences per occurrence class over 2014-2023	Number of occurrences per occurrence class in 2024	Comparison 2024 vs yearly average of 2014-2023 per occurrence class
Fatal accidents	**14**	**1**	=
Non-fatal accidents	**95**	**6**	↓
Serious incidents	**34**	**5**	↑

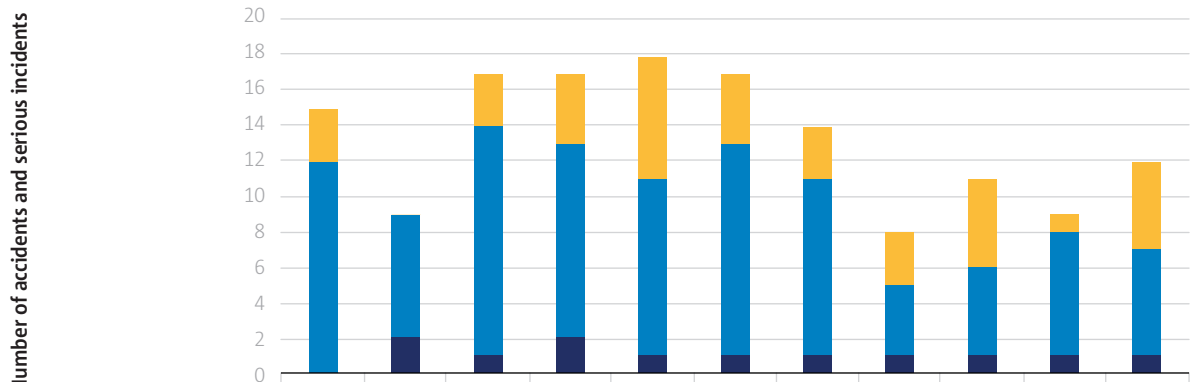
Table 3.5 Key statistics for SPO helicopters

	Number of fatalities	Number of serious injuries
Total number over 2014-2023	**22**	**39**
Yearly max number over 2014-2023	**11**	**8**
Yearly min number over 2014-2023	**0**	**1**
Total number in 2024	**1**	**3**

Table 3.6 Fatalities and serious injuries involving SPO helicopters

The number of accidents per year is shown in Figure 3.20.

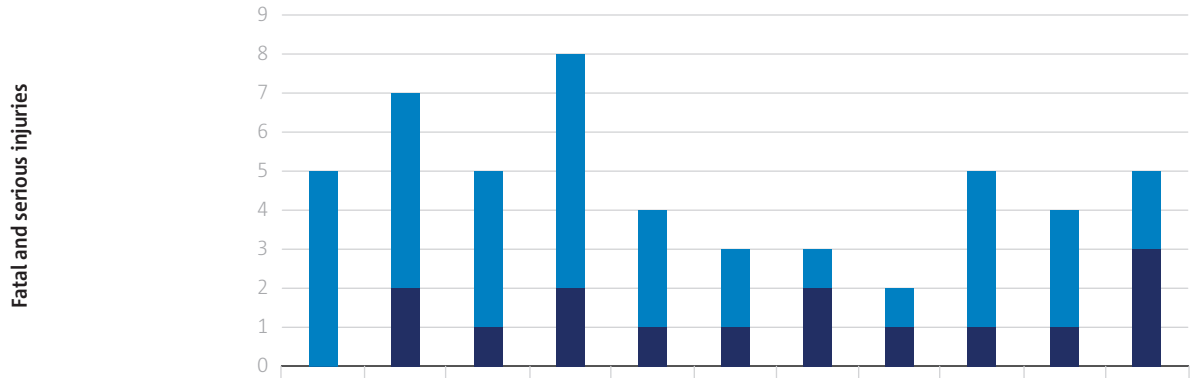
The total number of occurrences in 2024 remains stable and close to the average for the same period. However, a fatal accident occurred during powerline calibration operations, resulting in three deaths.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious incidents	3	0	3	4	7	4	3	3	5	1	5
Non-fatal accidents	12	7	13	11	10	12	10	4	5	7	6
Fatal accidents	0	2	1	2	1	1	1	1	1	1	1

Figure 3.20 Fatal accidents, non-fatal accidents and serious incidents per year involving SPO helicopters

The numbers of fatalities and serious injuries per year are shown in Figure 3.21. With three fatalities, the figures for 2024 reach the max of the preceding 10-year period.

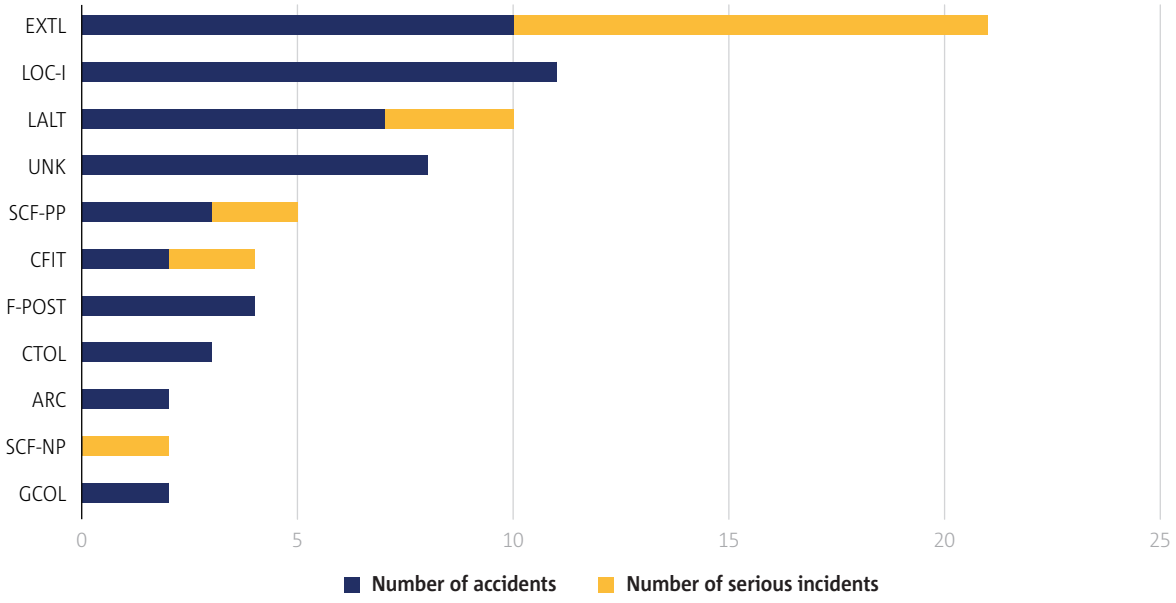


	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious Injuries	5	5	4	6	3	2	1	1	4	3	2
Fatalities	0	2	1	2	1	1	2	1	1	1	3

Figure 3.21 Fatal and serious injuries per year involving SPO helicopters

Occurrence categories

Figure 3.22 outlines the top occurrence categories assigned to the accidents in the past five years.

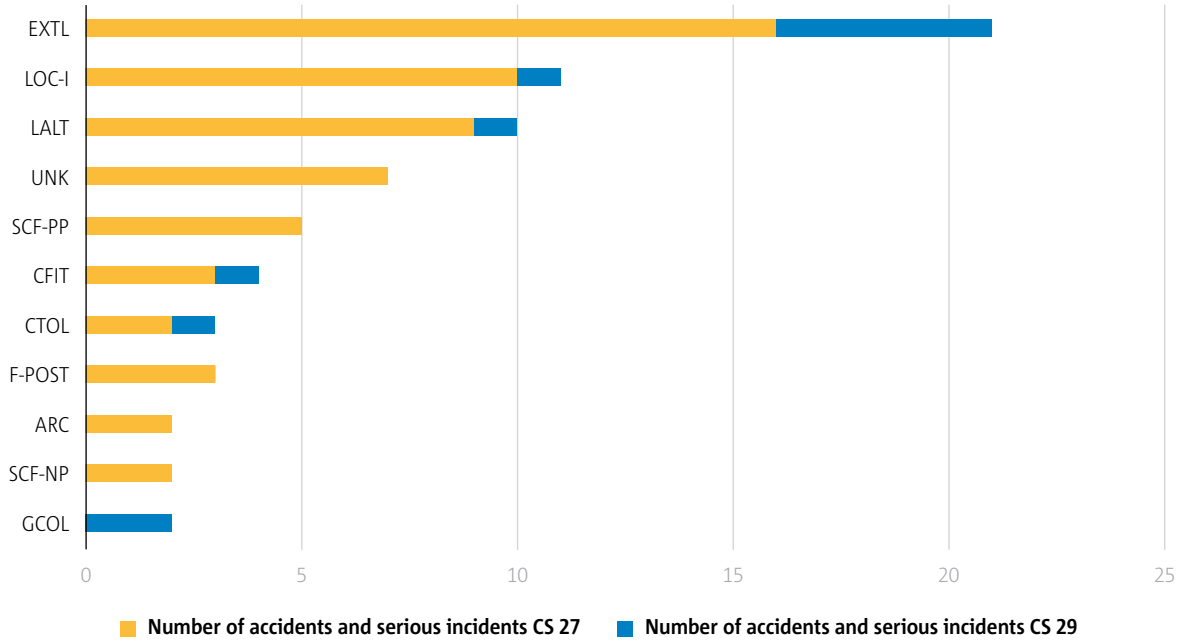


EXTL: External load related occurrences; LOC-I: Loss of control – inflight; LALT: Low altitude operations; UNK: Unknown or undetermined; SCF-PP: powerplant failure or malfunction; CFIT: Controlled flight into or toward terrain; F-POST: Fire/smoke (post-impact); CTOL: Collision with obstacle(s) during take-off and landing; ARC: Abnormal runway contact; SCF-NP: System/component failure or malfunction [non-powerplant]; GCOL: Ground Collision

Figure 3.22 Numbers of and accidents and serious incidents by occurrence category and occurrence class involving SPO helicopters

Specific to this type of operation, helicopters carry external loads for a variety of missions, hence the most frequent occurrence category associated with all accidents and serious incidents is EXTL: External load-related occurrences. It is followed by LOC-I: Loss of control – inflight and LALT being as well specific hazards for SPO and low-altitude operations.

The Figure 3.23 shows the breakdown of all accidents by ICAO ADREP taxonomy over the 5-year by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29).

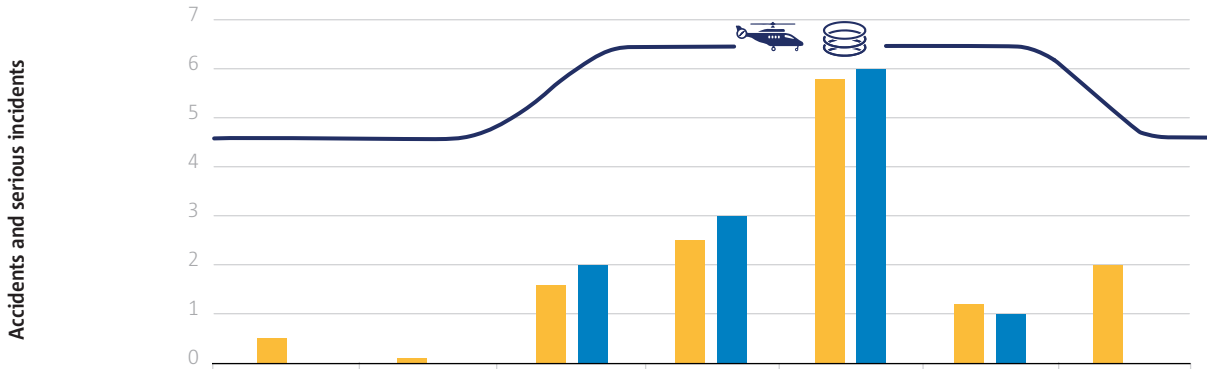


EXTL: External load related occurrences; LOC-I: Loss of control – inflight; LALT: Low altitude operations; UNK: Unknown or undetermined; SCF- PP: powerplant failure or malfunction; CFIT: Controlled flight into or toward terrain; CTOL: Collision with obstacle(s) during take-off and landing; F-POST: Fire/smoke (post-impact); ARC: Abnormal runway contact; SCF-NP: System/component failure or malfunction [non-powerplant]; GCOL: Ground Collision

Figure 3.23 Numbers of accidents and serious incidents by occurrence category and aircraft certification type involving SPO helicopters

Phase of flight

Figure 3.24 shows the breakdown of accidents by flight phase for SPO. As was the case with the average of the preceding 10-year period, the highest number of accidents in 2024 happened during the manoeuvring phase, which is expected for helicopters performing SPO, as the risk undertaken is the highest when performing the activities, such as high-dimension lifting devices, power line operations or constructing a large mast.

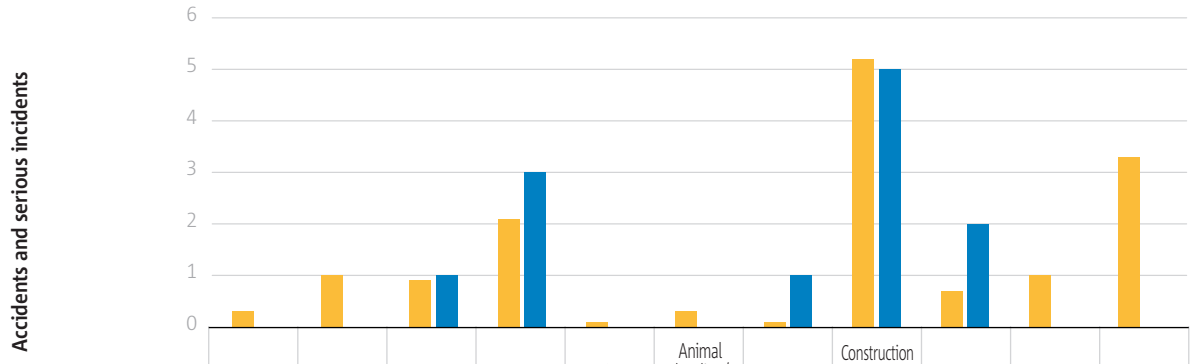


	Standing	Taxi	Take-off	En route	Manoeuvring	Approach	Landing
Average 2014-2023	0.5	0.1	1.6	2.5	5.8	1.2	2
2024	0	0	2	3	6	1	0

Figure 3.24 Accidents and serious incidents by phase of flight involving SPO helicopters

Operation type

Figure 3.25 shows the number of accidents er sub-type of SPO operations.

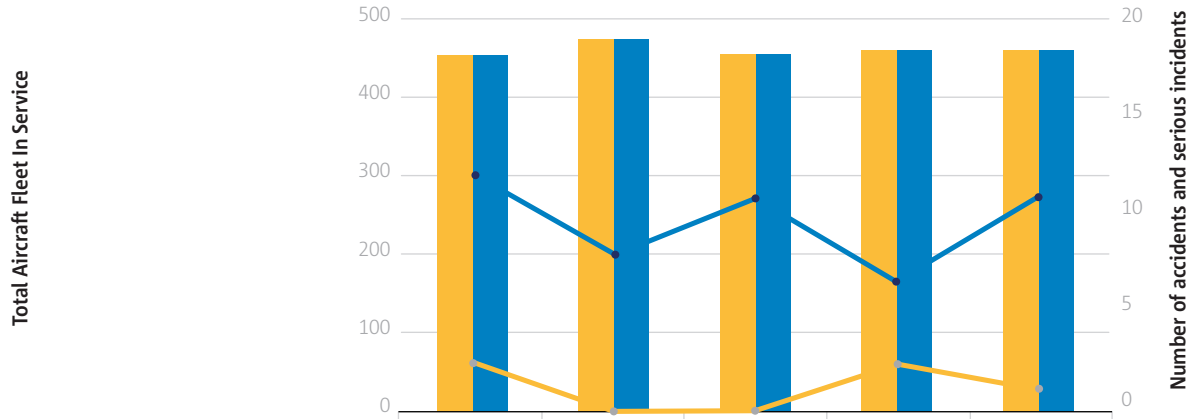


	Aerial observation	Aerial patrol	Aerial survey	Agricultural	Airshow /race	Animal herding/ mustering	Calibration	Construction sling/ load	Logging	Photography	Other/ unknown
Average 2014-2023	0.3	1	0.9	2.1	0.1	0.3	0.1	5.2	0.7	1	3.3
2024	0	0	1	3	0	0	1	5	2	0	0

Figure 3.25 Accidents and serious incidents by operation type involving SPO helicopters

Propulsion type

Figure 3.26 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of propulsion and with a trendline of accidents and serious incidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas total number of accidents and serious incidents in each period is shown in the secondary vertical axis.

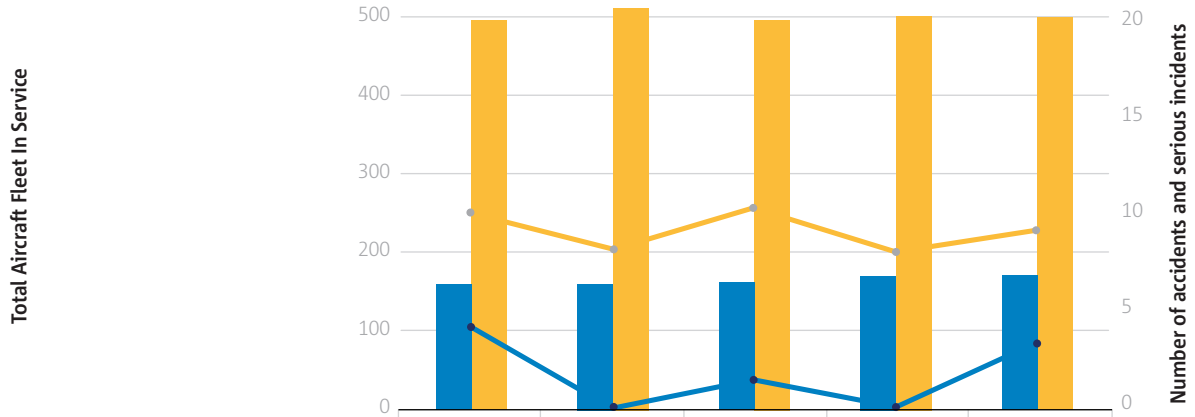


	2020	2021	2022	2023	2024
Reciprocating Total In Service	455	475	456	461	461
Turboshaft Total In Service	455	475	456	461	461
Reciprocating Accidents and Serious incidents	2	0	0	2	1
Turboshaft Accidents and Serious incidents	12	8	11	7	11

Figure 3.26 Accidents and serious incidents by propulsion type involving SPO helicopters with the breakdown of propulsion type for the reported fleet

Helicopter certification specification (CS27/CS29)

Figure 3.27 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29), with a trendline of accidents and serious incidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas the total number of accidents and serious incidents in each period is shown in the secondary vertical axis.



	2020	2021	2022	2023	2024
CS 29 Total In Service	160	161	163	171	172
CS 27 Total In Service	497	513	498	503	501
CS 29 Accidents and Serious incidents	4	0	1	0	3
CS 27 Accidents and Serious incidents	10	8	10	8	9

Figure 3.27 Accidents and serious incidents by certification specification (CS27/CS29) for SPO with the breakdown of aircraft certification type for the reported fleet

Safety risks

The safety risks for SPO helicopters are derived from occurrences data recorded the ECR, covering the two-year period 2023-2024.

With an average of approximately 260 occurrences per year, 330 were completed with an ERCS safety risk score, resulting a 63% ERCS completion rate for the domain.

When considering only accidents and serious incidents, the ERCS completion rate for the domain rises to 93%.

The relative comparison between KRAs for this domain is highlighted in Figure 3.28. KRAs and occurrence categories (refer to core document Figure 3.22) have different purposes. While occurrence categories describe actual factors and outcomes of an occurrence, KRAs describe the potential outcome of an occurrence. The KRA is defined by the most likely type of accident that an occurrence could have escalated to. Unlike occurrence categories, where multiple categories may be assigned to a single occurrence, there can only be one KRA per occurrence. The KRA is one element of the ERCS. This scheme is applied when determining the safety risk score of an occurrence and is further detailed in the ASR introduction.

When it comes to KRA, obstacle collision in flight is most risky in terms of aggregated risk, which is not surprising given the conditions and the common environmental factors that come with this type of operation. Helicopter pilots navigate the most harrowing environments known to flight, where recovery has no margin for delayed and human reaction.

Aircraft upset or loss of control remains in top three , terms of both, number of occurrences and aggregated risk and represents a strong reminder of the potential for disastrous consequences.

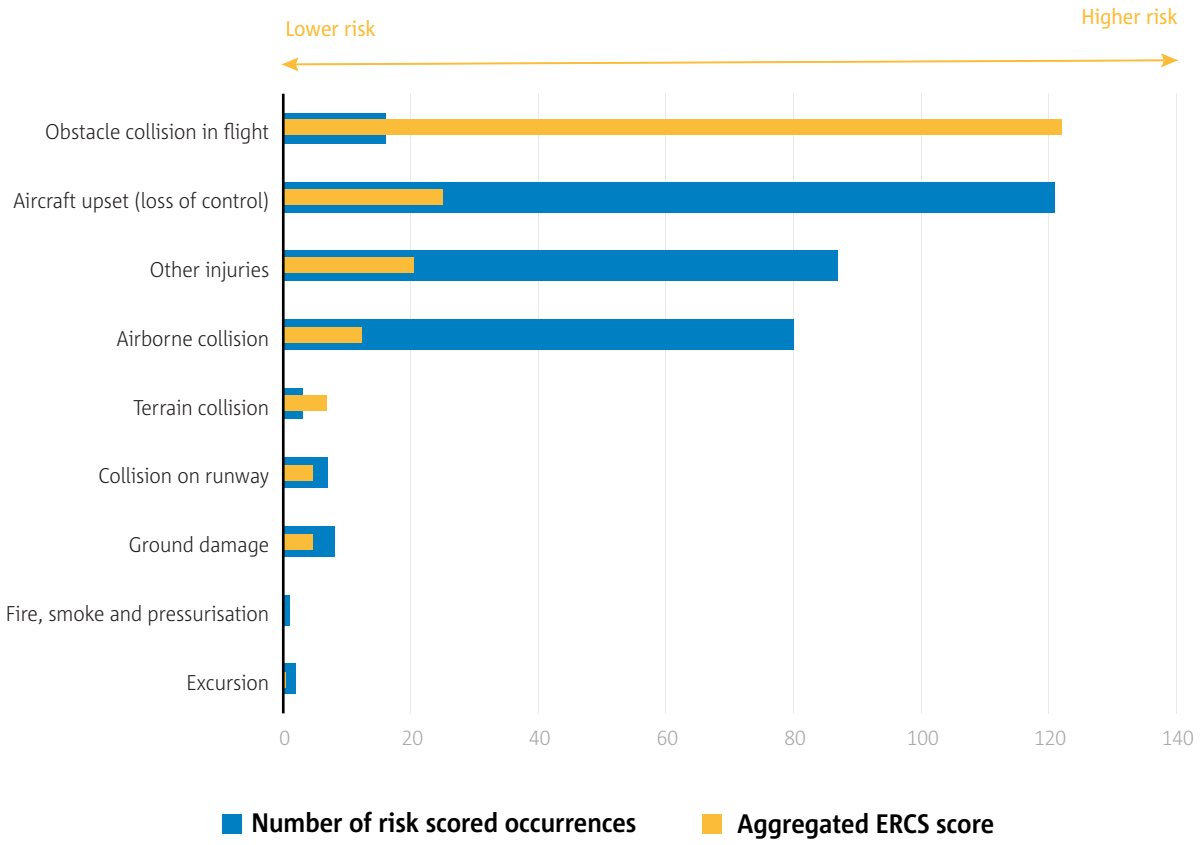


Figure 3.28 KRAs by aggregated ERCS score and number of risk-scored occurrences involving SPO helicopters

3.4 Non-commercial operations (NCO) helicopters

This section presents the main safety statistics for EASA certified or validated helicopters performing NCO with an EASA Member State as state of operator or state of registry. The type of flying included in this section are mainly flight training, test flights, leisure flights and ferry flights.

Key statistics

The key statistics for this domain are in Table 3.7 and Table 3.8, which includes a comparison of the number of fatal and non-fatal accidents 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.

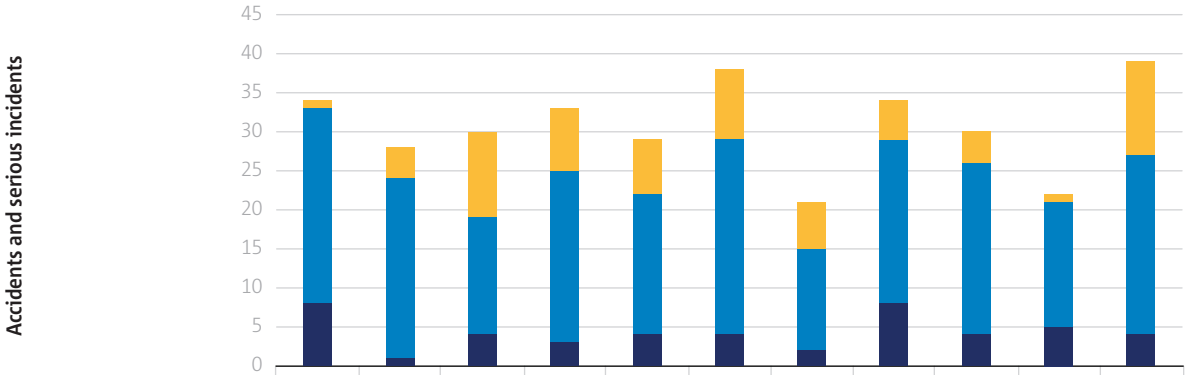
	Total number of occurrences per occurrence class over 2014-2023	Number of occurrences per occurrence class in 2024	Comparison 2024 vs yearly average of 2014-2023 per occurrence class
Fatal accidents	**45**	**4**	=
Non-fatal accidents	**219**	**23**	↓
Serious incidents	**58**	**12**	↑

Table 3.7 Key statistics for NCO helicopters

	Number of fatalities	Number of serious injuries
Total number over 2014-2023	**71**	**49**
Yearly max number over 2014-2023	**20**	**11**
Yearly min number over 2014-2023	**1**	**2**
Total number in 2024	**7**	**5**

Table 3.8 Fatalities and serious injuries involving NCO helicopters

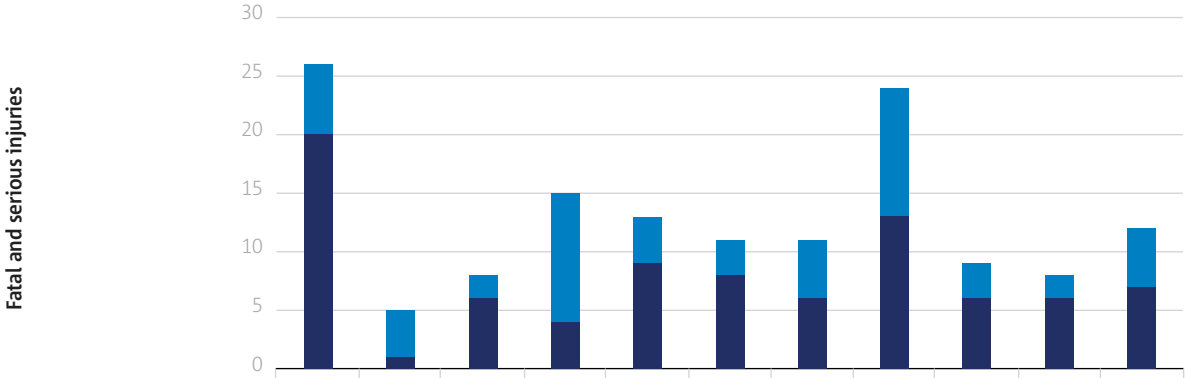
In 2024, the total number of accidents, including fatal, non-fatal, and serious incidents reached its highest level compared to the average of the previous decade, making it the peak year in the last 10 years. Despite this rise, the fatality risk in 2024 remained below average, ranking among the three lowest years for fatalities and serious injuries.



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious incident	1	4	11	8	7	9	6	5	4	1	12
Non-fatal accident	25	23	15	22	18	25	13	21	22	16	23
Fatal accident	8	1	4	3	4	4	2	8	4	5	4

Figure 3.29 Fatal accidents, non-fatal accidents and serious incidents per year involving NCO helicopters

The numbers of fatalities and serious injuries per year are shown in Figure 3.30.

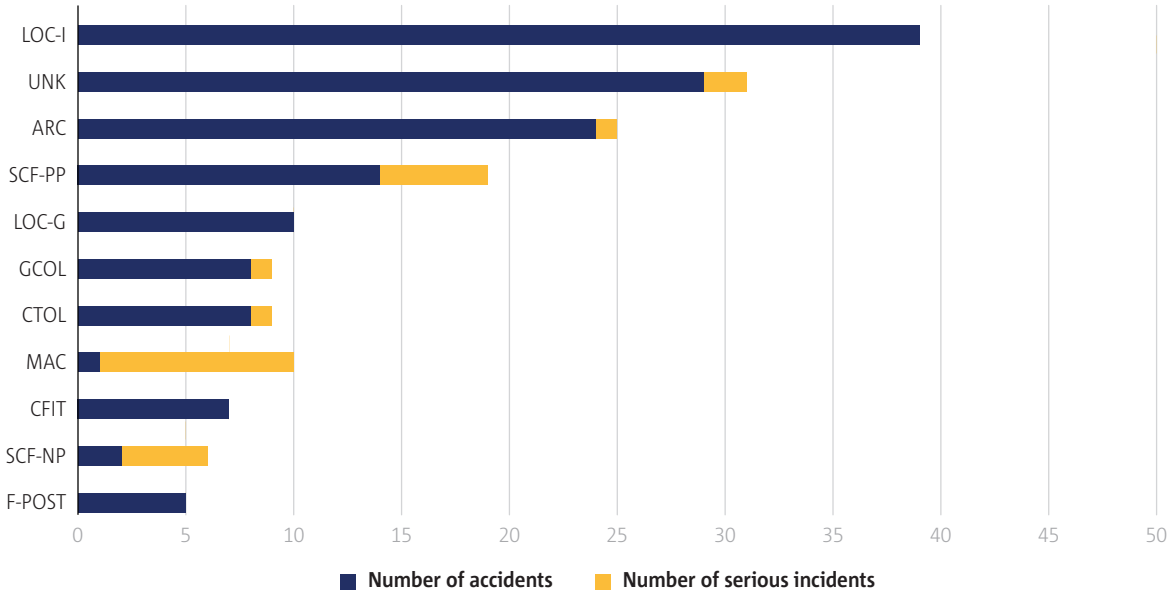


	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Serious Injuries	6	4	2	11	4	3	5	11	3	2	5
Fatalities	20	1	6	4	9	8	6	13	6	6	7

Figure 3.30 Fatal and serious injuries per year involving NCO helicopters

Occurrence categories

Figure 3.31 outlines the top occurrence categories assigned to the accidents in the past five years.



LOC-I: Loss of control – inflight; UNK: Unknown or undetermined; ARC: Abnormal runway contact; SCF-PP: powerplant failure or malfunction; LOC-G: Loss of control – ground; CTOL: Collision with obstacle(s) during take-off and landing; MAC: Airprox/ACAS alert/loss of separation/ (near) midair collisions; CFIT: Controlled flight into or toward terrain; GCOL: Ground Collision; SCF-NP: System/ component failure or malfunction [non-powerplant]; ; F-POST: Fire/smoke (post-impact);

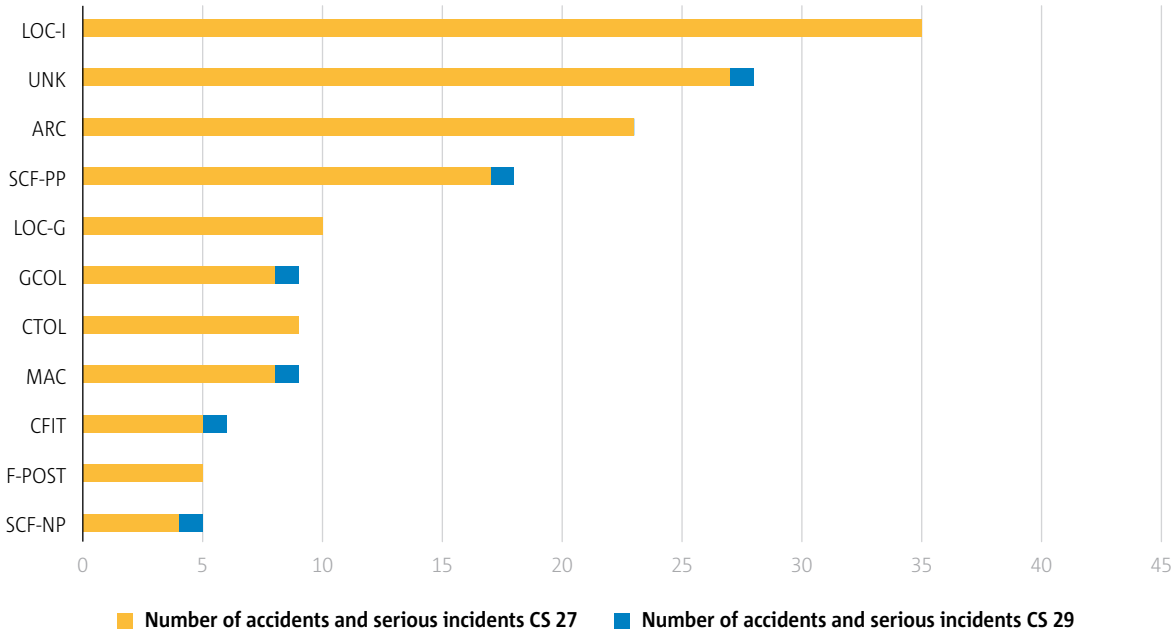
Figure 3.31 Numbers of accidents and serious incidents by occurrence category and occurrence class involving NCO helicopters

Occurrences are categorised using the ICAO ADREP taxonomy for occurrence categories, developed for supporting common coding of the main elements of an occurrence that should be investigated, recorded, and analysed.

Loss of control in flight (LOC-I) emerges as the primary occurrence category for non-commercial operations, with flight training missions being notably susceptible. Notably, all occurrences categorized under LOC-I have resulted in accidents, highlighting their high-risk nature.

Abnormal ground contact with the runway (ARC) is the third key risk area, after UNK: Unknown or undetermined. Similarly, this scenario is one of the main ones appearing in flight training and excursion from/overshooting of the helipad. Events such as hard/heavy landings, off centre landings are included in this category. Includes any rotor striking the intended landing surface during take-off and landing. However, if loss of control or collision occurred, the event is also coded under the appropriate categories: LOC-I: Loss of control – inflight; LOC-G: Loss of control – ground; GCOL: Ground Collision; CTOL: Collision with obstacle(s) during take-off and landing.

The Figure 3.32 shows the breakdown of all accidents by ICAO ADREP taxonomy over the 5-year by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29).

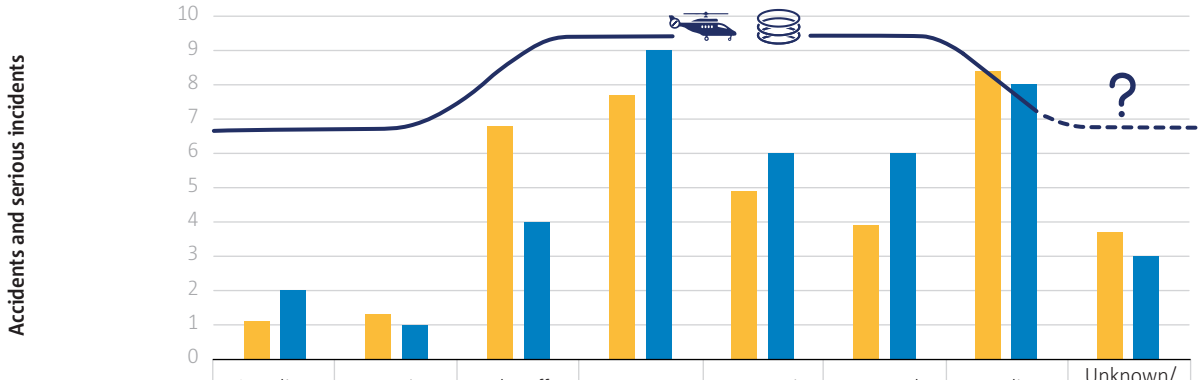


LOC-I: Loss of control – inflight; UNK: Unknown or undetermined; ARC: Abnormal runway contact; SCF-PP: powerplant failure or malfunction; LOC-G: Loss of control – ground; CTOL: Collision with obstacle(s) during take-off and landing; MAC: Airprox/ACAS alert/loss of separation/ (near) midair collisions; CFIT: Controlled flight into or toward terrain; F-POST: Fire/smoke (post-impact); SCF-NP: System/ component failure or malfunction [non-powerplant]

Figure 3.32 Numbers of accidents and serious incidents by occurrence category and aircraft certification type involving NCO helicopters

Phase of flight

Figure 3.33 shows the distribution of accidents by flight phase.



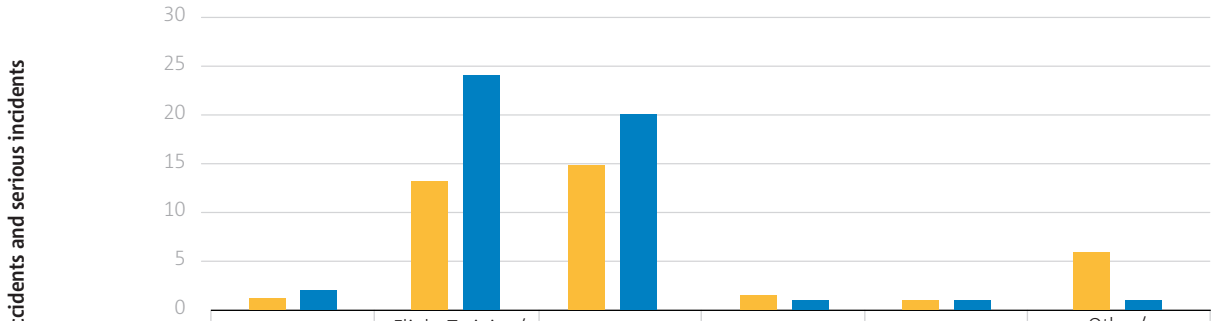
	Standing	Taxi	Take-off	En route	Manoeuvring	Approach	Landing	Unknown/ blank
Average 2014-2023	1.1	1.3	6.8	7.7	4.9	3.9	8.4	3.7
2024	2	1	4	9	6	6	8	3

Figure 3.33 Accidents and serious incidents by phase of flight involving NCO helicopters

Operation type

Figure 3.34 shows the number of accidents per type of operation.

In 2024, as in the previous decade, the highest number of occurrences with identified operation types were in pleasure flights and flight training/instructional operations. Notably, in 2024, there were three fatal accidents in flight training/instructional operations out of four of total in NCO operation, the highest number recorded during the analysed period.



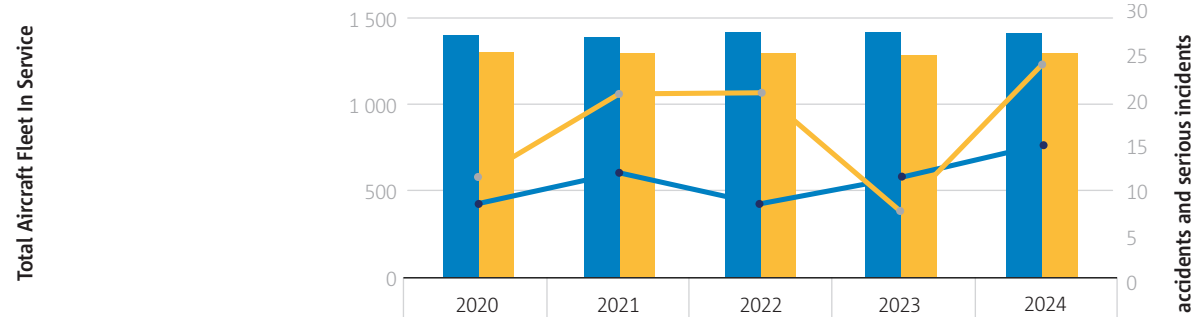
	Business	Flight Training/ Instructional	Pleasure	Relocation	Test Flight	Other/ unknown
Average 2014-2023	1.2	13.2	14.8	1.5	1	5.9
2024	2	24	20	1	1	1

Figure 3.34 Accidents and serious incidents by operation type involving NCO helicopters

Propulsion type

Figure 3.35 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of propulsion and with a trendline of accidents and serious incidents in the given period.

The total fleet in service is shown in the primary vertical axis of the graph, whereas the total number of accidents in each period is shown in the secondary vertical axis.



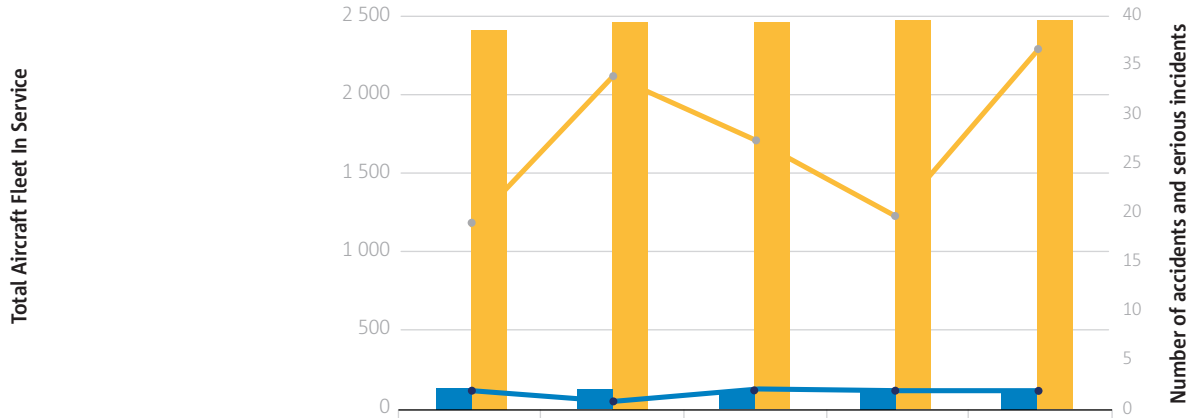
	2020	2021	2022	2023	2024
Turboshaft Total In Service	1 388	1 421	1 419	1 415	1 415
Reciprocating Total In Service	1 294	1 299	1 285	1 294	1 294
Turboshaft Accidents and Serious incidents	9	13	9	11	14
Reciprocating Accidents and Serious incidents	12	21	21	9	25

Figure 3.35 Accidents and serious incidents by propulsion type involving NCO helicopters with the breakdown of propulsion type for the reported fleet

Helicopter certification specification (CS27/CS29)

Figure 3.36 shows the distribution over the 5-year period of the EASA Member State rotorcraft fleets in total by type of certification specification, Certification Specifications for Small Rotorcraft (CS-27) and the Certification Specifications for Large Rotorcraft (CS-29), with a trendline of accidents and serious incidents in the given period. The total fleet in service is shown in the primary vertical axis of the graph, whereas total number of accidents and serious incidents in each period is shown in the secondary vertical axis.

A stable trend is observed for the number of occurrences in Large Rotorcraft (CS-29), whereas a notable increase for Small Rotorcraft (CS-27) reaching the maximum over the analysis period.



	2020	2021	2022	2023	2024
CS 29 Total In Service	136	125	120	117	117
CS 27 Total In Service	2 420	2 469	2 468	2 479	2 479
CS 29 Accidents and Serious incidents	2	1	2	2	2
CS 27 Accidents and Serious incidents	19	33	28	20	37

Figure 3.36 Accidents and serious incidents by certification specification (CS27/CS29) for NCO with the breakdown of aircraft certification type for the reported fleet

Safety risks

The safety risks for NCO helicopters are derived from occurrences data recorded the ECR, covering the two-year period 2023-2024.

With an average of approximately 487 occurrences per year, 587 were completed with an ERCS safety risk score, resulting a 60% ERCS completion rate for the domain.

When considering only accidents and serious incidents, the ERCS completion rate for the domain rises to 85%.

The relative comparison between KRAs for this domain is highlighted in Figure 3.37

KRAs and occurrence categories (refer to core document Figure 3.31) have different purposes. While occurrence categories describe actual factors and outcomes of an occurrence, KRAs describe the potential outcome of an occurrence. The KRA is defined by the most likely type of accident that an occurrence could have escalated to. Unlike occurrence categories, where multiple categories may be assigned to a single occurrence, there can only

be one KRA per occurrence. The KRA is one element of the ERCS. This scheme is applied when determining the safety risk score of an occurrence and is further detailed in the ASR introduction.

The data reviewed on the occurrences involving NCO helicopters shows that terrain collision is by far the top KRA in terms of aggregated risk, followed by aircraft upset which is high risk in both number of occurrences and ERCS score. This is to be expected considering that the speed of the impact in controlled flight into terrain can have substantial energy and therefore high-risk score. On top of this, the flight envelope that they are being exposed in in flight training mission presents more risk as well (e.g., engine off landings, practice forced landings, advanced autorotations). Airborne collision is a top KRA in terms of both, number of occurrences and aggregated risk and represents a strong reminder of the high energy; highlighting the importance of taking the necessary precautions to avoid such a catastrophic event. It serves as a warning to pilots and other aircraft operators to be extra vigilant when flying in the vicinity of other aircraft. Furthermore, it emphasises the need for improved safety protocols and regulations to reduce the risk of aircraft collisions.

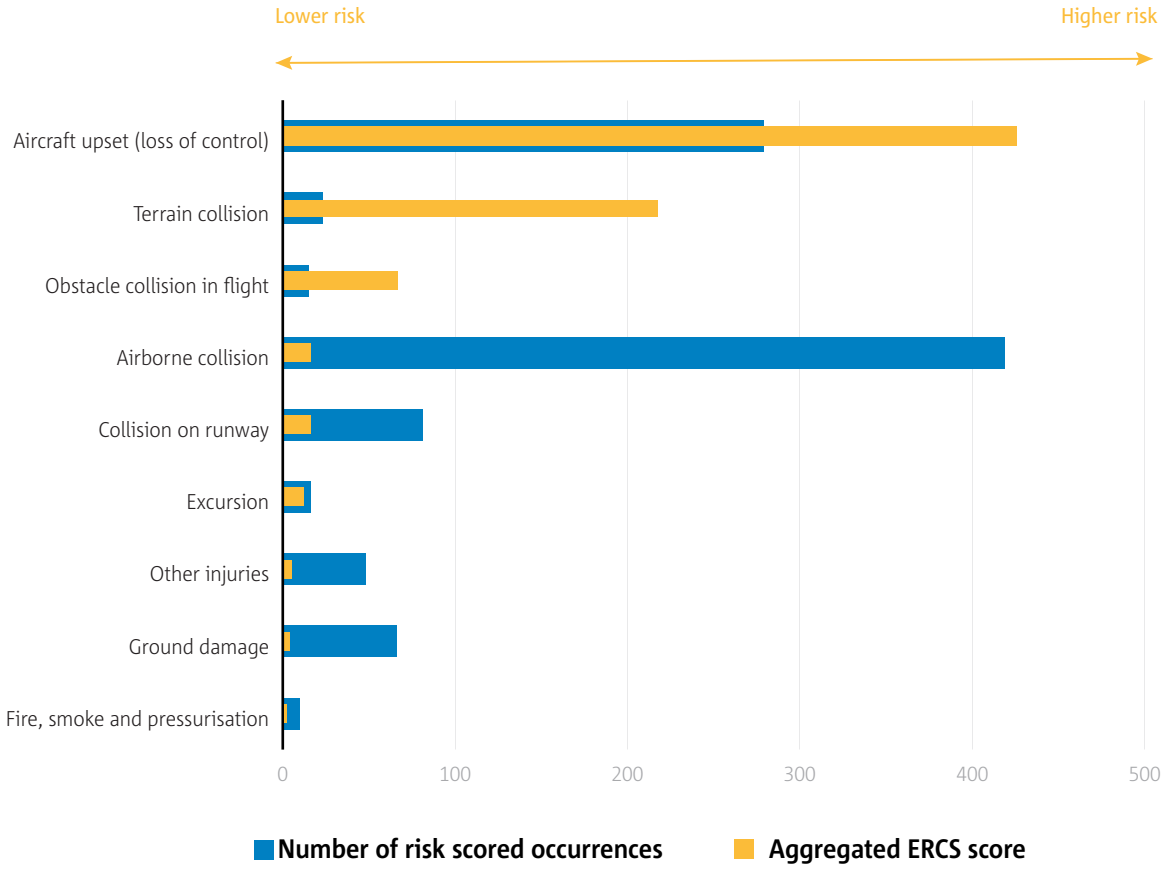


Figure 3.37 KRAs by aggregated ERCS score and number of risk-scored occurrences involving NCO helicopters