

Helicopter accidents in Argentina

Accidentes protagonizados por helicópteros en Argentina

**Area of Studies and
Development of the
National
Department
of Aviation Occurrences
Investigation**

Keywords: TRANSPORT-
SAFETY- AERONAUTICAL-
STATISTICS- ACCIDENTS-
HELICOPTERS.

Palabras clave: TRANSPORTE-
SEGURIDAD OPERACIONAL-
AERONÁUTICO-
ESTADÍSTICAS- ACCIDENTES-
HELICÓPTEROS.

Received: 04/12/2022

Accepted: 08/01/2023

Abstract

This article presents an extract from the bulletin that analyses the accidents involving helicopters in Argentina over the last ten years, intending to show the latent conditions of the system and expose the accidents, fatal and non-fatal, and presents them according to their characteristics using the categories of events established by the Common Taxonomy Team (CICTT) of the International Civil Aviation Organization (ICAO). The phases of flight, the type of operation and the location of the events are georeferenced on a map.

Resumen

Este artículo presenta un extracto del boletín que analiza los accidentes protagonizados por helicópteros en la República Argentina en los últimos diez años, con el objetivo de mostrar las condiciones latentes del sistema y expone los accidentes, fatales y no fatales, y se los presenta según sus características mediante las categorías de sucesos establecidas por el Common Common la Organización de Aviación Civil Internacional (OACI). Se contemplan las fases de vuelo, el tipo de operación y la ubicación de los sucesos georreferenciados en un mapa.


This work presents both fatal and non-fatal accidents and categorizes them according to their characteristics using the categories established by the Common Taxonomy Team (CICCT) of the International Civil Aviation Organization (ICAO). It covers flight phases, the type of operation, and the georeferenced location of occurrences on a map.

Historical Series: 2013 to 2022 Period

In the period under review, 28 accidents involving 29 helicopters were recorded; 7 of them were fatal. None occurred in the last year.

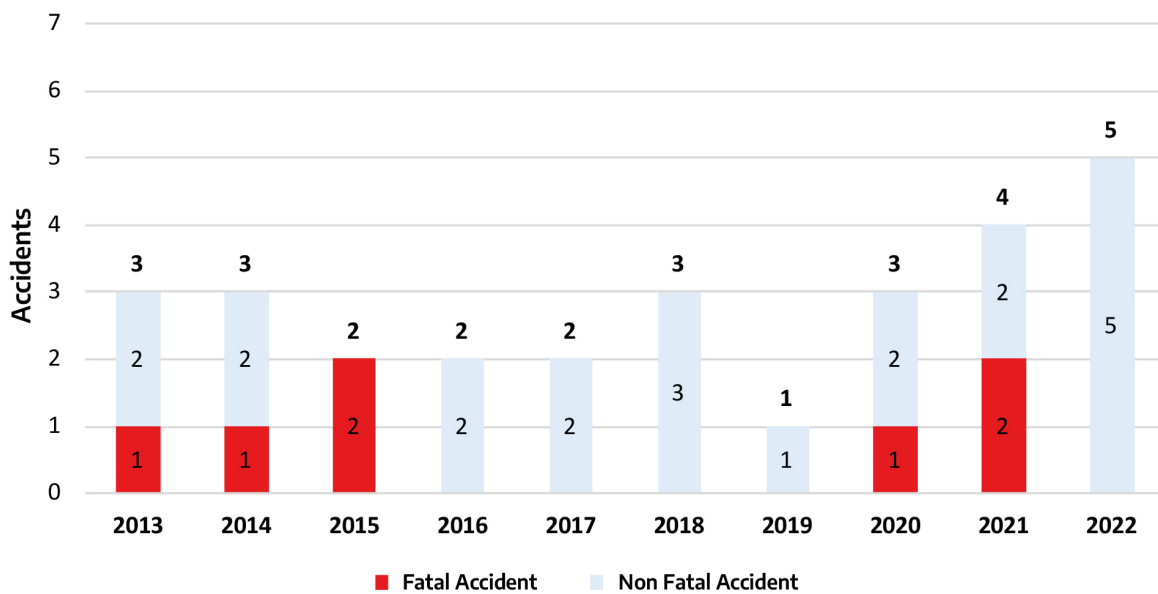
7

2013-2022
FATAL
ACCIDENTS



2 TWIN-ENGINE
27 SINGLE-ENGINE

Graph 1. Fatal and non-fatal occurrences per year



Source: ADREP/ECCAIRS system, JST's Repository.

Analysis by Occurrence Categories

For the analysis of occurrence categories, those with more than two recordings were taken into account. Notable categories include loss of control in flight (LOC-I) and low-altitude operations (LALT). Fire and/or smoke occurrences after impact (F-POST) are related to other categories, associated to the resulting circumstances, especially LOC-I accidents.

10

2013-2022
LOC-I



4

2013-2022
LALT





“During the analyzed period, 28 accidents involving 29 helicopters were recorded, with 7 of them being fatal. None occurred in the last year.”

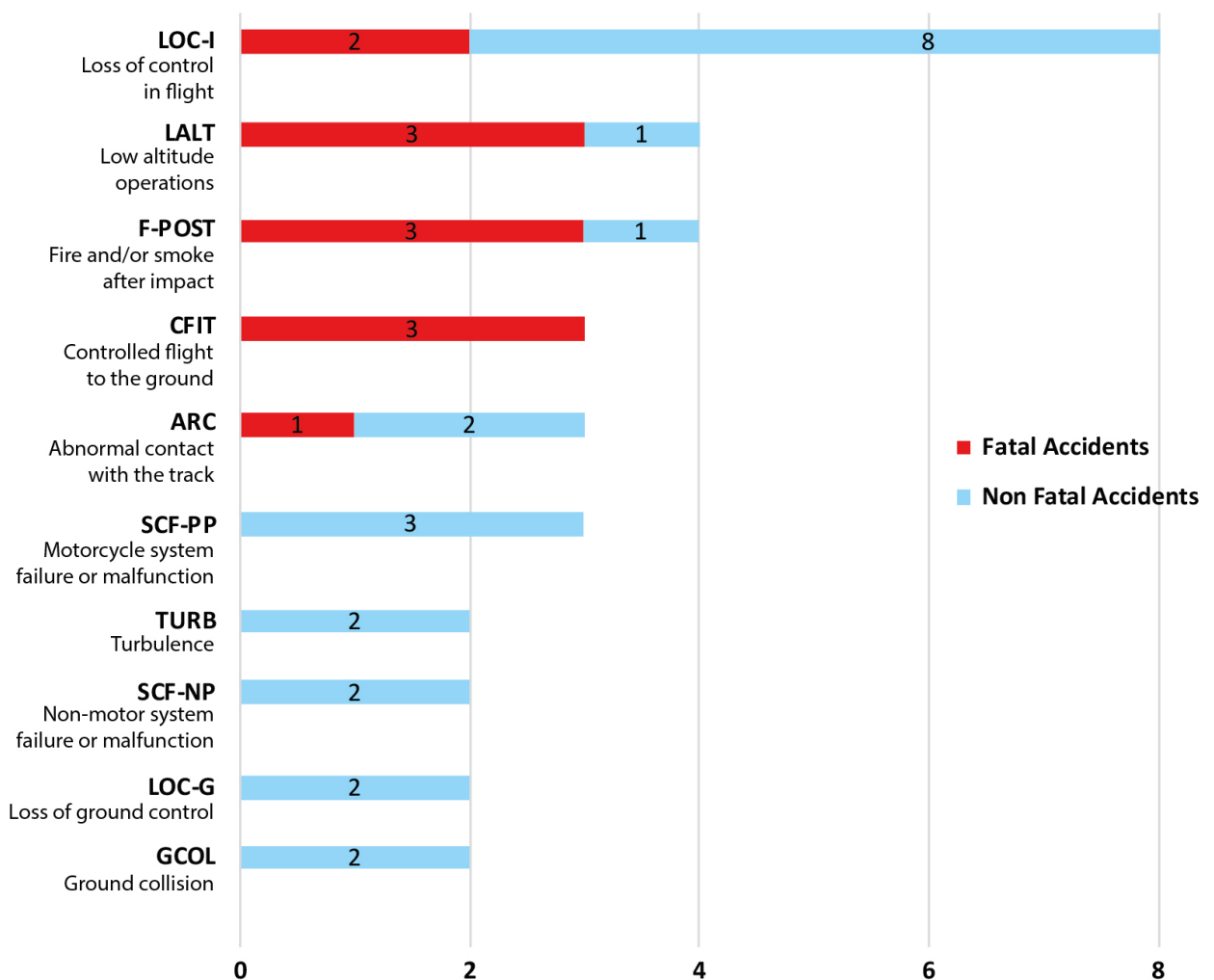


Additionally, five categories were recorded with only one occurrence: MAC, NAV, CTOL, ADRM, and F-NI (see glossary).

Categories related to controlled flight into terrain (CFIT), abnormal runway contact (ARC), and engine system failure or malfunction (SCF-PP) are also highlighted. These categories can be associated with each other or with other categories such as LOC-I and LALT in the same occurrence.

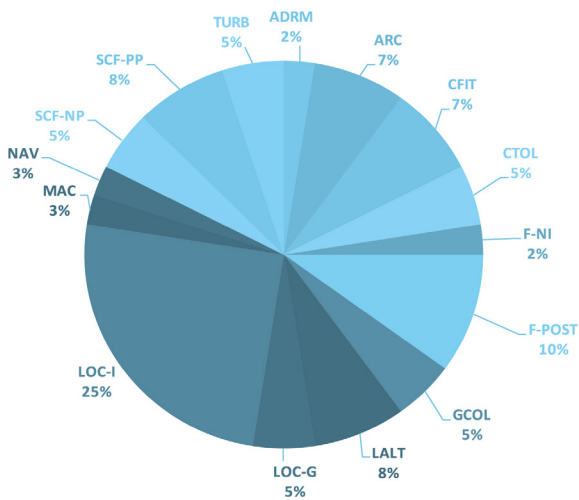
Fatalities were recorded in the occurrence categories LALT, F-POST, and CFIT, with three fatalities each; LOC-I with 2; ARC, MAC, and NAV with 1 (MAC and NAV are not shown in the chart due to having only one occurrence in the study period, which was fatal).

Graph 2. Occurrence categories with helicopters involved 2012-2023



Source: ADREP/ECAIRS system, JST’s Repository.

Graph 3. Accident categories 2012-2023 with helicopters involved



Source: ADREP/ECCAIRS system, JST Repository. DREP/ECCAIRS, JST Repository.

The analysis of categorized LOC-I accidents allowed for the identification of their origin, which is largely operational aspects of helicopters.

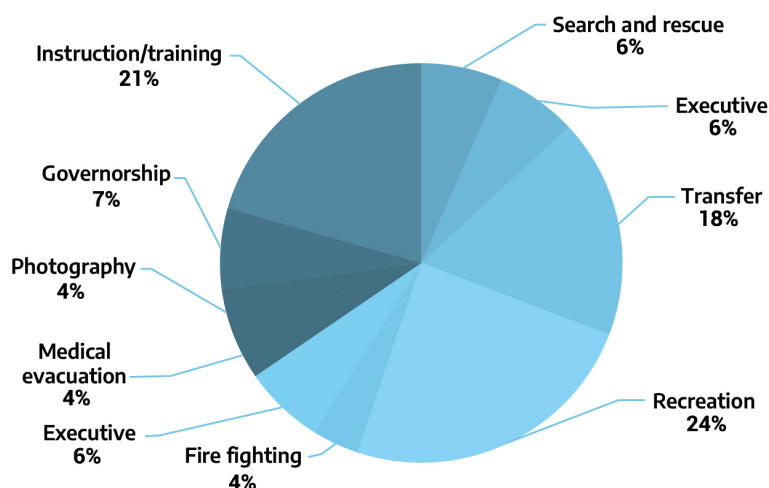
It was also identified that the loss of tail rotor effectiveness (LTE) is recurrent, caused by sudden wind gusts that, when combined with not operating the aircraft within the parameters established in the manual – including the tail rotor effectiveness table – create conditions favorable to accidents.

Another identified factor was deficient, incomplete, or insufficient flight planning. There were accidents where flight planning did not match the helicopter's performance, especially in high-altitude and high-temperature flights.

“The analysis of the type of operation conducted by the helicopters at the time of the accident, identified that 71% fell within general aviation.”



Graph 4. Operation sub-type of the helicopters involved



Source: ADREP/ECCAIRS system, JST's Repository.

Analysis by Types of Operations

From the analysis of the type of operation runned by the helicopters at the time of the accident, it was identified that 71% fell within general aviation.

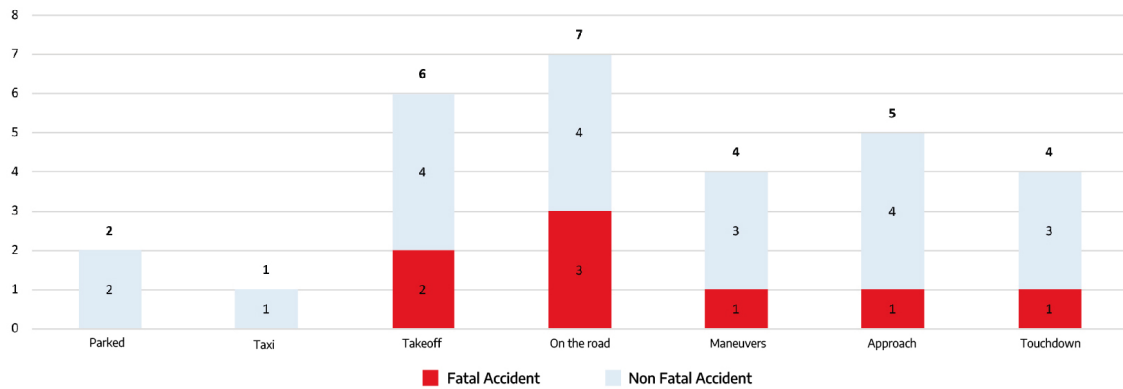
Additionally, it is observed that the majority (26% of accidents) involve general aviation operations in the form of recreational flights, and 22% involve instruction or training operations. General aviation is further complemented by transfer flights and test flights, representing 19% and 7% of operations, respectively.

Analysis by Flight Phases

From the analysis by flight phases, en route (ENR) accounts for 25% of accidents, and takeoff (TOF) accounts for 21%, concentrating the majority of fatalities. This is followed by the approach phase (APR) at 18%, and maneuvering (MNV) and landing

(LDG) phases at 14%. In the APR, LDG, and TOF phases, impacts with obstacles or turbulence interference, both from the location and those generated by the helicopter itself, are common, resulting in loss of control.

Graph 5. Helicopters involved in fatal and non-fatal incidents by flight phase

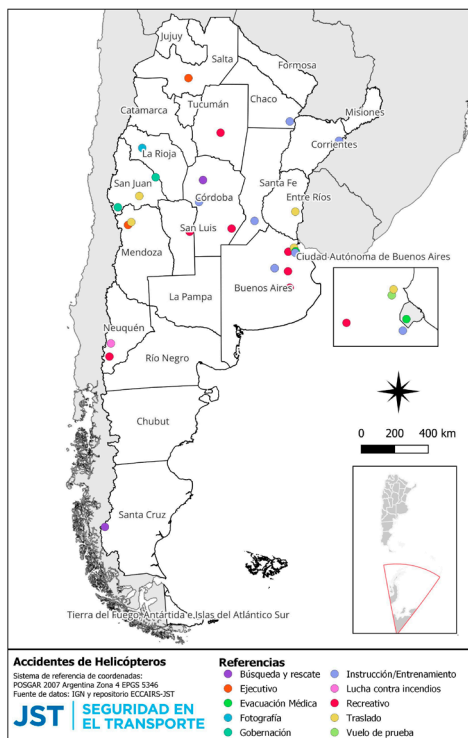


Source: ADREP/ECAIRS system, JST's Repository.

Accident Locations

For accident location, the occurrence sites were georeferenced and are illustrated in the figure below:

Figure 1. Georeferencing of occurrence locations



Source: Own elaboration.

Glossary

Occurrences Categories:

- ADRM:** Related to the aerodrome
- ARC:** Abnormal runway contact
- CFIT:** Controlled flight into terrain
- CTOL:** Collision during takeoff/landing
- F-NI:** Fire and/or smoke without impact
- F-POST:** Fire and/or smoke with impact
- GCOL:** Ground collision
- LALT:** Low-altitude operations
- LOC-G:** Loss of control on the ground
- LOC-I:** Loss of control in flight
- MAC:** Mid-air collision/near collision/loss of separation in flight
- NAV:** Navigation errors
- SCF-NP:** Failure of systems/components unrelated to the engine
- SCF-PP:** Failure of engine systems/components
- TURB:** Turbulence

Flight Phases:

- STD:** Stationary
- TXI:** Taxiing
- TOF:** Takeoff
- ENR:** En route
- MNV:** Maneuvers
- APR:** Approach
- LDG:** Landing

Other acronyms:

- CAST:** Commercial aviation operational safety team
- CICTT:** Common taxonomy team of CAST/ICAO
- LTE:** Loss of tail rotor effectiveness
- ICAO:** International Civil Aviation Organization