



2024 Safety Report

Flight Safety Foundation

February 2025

Introduction

Flight Safety Foundation is concerned about recent trends in noncompliance with standard operating procedures (SOPs), regulations, and international aviation standards that are undermining aviation safety. The aviation industry has long benefited from a robust safety framework. However, recent events highlight the urgent need for a renewed commitment to compliance with regulations and adherence to international standards. The public expects continuous improvements in aviation safety but lapses in compliance and adherence to these standards are eroding public confidence in the industry's ability to maintain its strong safety record. To reverse these trends and restore trust, collective action is urgently needed to uphold and strengthen aviation safety worldwide.

Over the years, SOPs, international standards, and regulations have evolved to address emerging risks and operational complexities. These rules are designed with one primary goal: to ensure safety. Adherence to these established protocols is critical to maintaining the high safety standards the aviation industry has achieved. While we recognize that compliance alone is not sufficient to guarantee safety, it remains a necessary first step. A comprehensive approach that goes beyond compliance — embedding robust safety cultures and proactive risk management — is essential for sustained safety performance.

In 2024, commercial aviation continued to support the safe transport of an estimated 5 billion passengers worldwide. While the number of accidents and incidents remains small relative to the overall volume of flights (more than 40 million), the frequency and severity of certain occurrences in a short period of time have raised significant concerns among the public, regulators, and industry stakeholders. The foundation of global aviation safety — rooted in international standards, SOP compliance, and a strong safety culture — is under increasing pressure and must be reinforced through an industrywide recommitment to these principles. The fatal accidents and serious incidents in 2024 and the early weeks of 2025 serve as a sobering reminder of aviation's inherent risks and the importance of maintaining a relentless focus on safety.

An analysis of data from the Foundation's Aviation Safety Network (ASN) database reveals that the industry continued to struggle with persistent safety issues in 2024, including turbulence-related accidents, runway incursions and excursions, and abnormal runway contact events. Additionally, a series of high-profile near misses and concerning incidents last year undermined public confidence in the safety of air travel and the effectiveness of regulatory oversight.

The Azerbaijan Airlines Embraer ERJ-190AR crash on Dec. 25 demonstrated, once again, the critical risks associated with operating in and around conflict zones. Aviation safety demands constant vigilance, and it is crucial that operators proactively monitor and mitigate risks associated with these operations. States must also uphold their responsibilities by proactively closing airspace or implementing appropriate measures to safeguard the lives of passengers and crew aboard civilian aircraft.

As 2024 ended and 2025 began, a spate of fatal accidents further eroded industry confidence and should serve as a wake-up call that the aviation safety net may be fraying. Immediate action is needed to reinforce compliance with international safety standards and regulations.

The Dec. 29 Jeju Air Boeing 737-800 crash in Muan, South Korea, further illustrates systemic safety vulnerabilities. The aircraft landed on its belly following a reported bird strike, slid off the runway, and collided with a two-meter (six-foot) concrete wall at the end of the runway, upon which an instrument landing system localizer antenna array was installed. This type of concrete wall does not meet International Civil Aviation Organization (ICAO) frangibility standards for structures at the ends of runways. Since the accident, seven similar structures at other airports in South Korea have been identified, and plans are underway to dismantle them.

Early 2025 has already seen multiple fatal or high-profile accidents, including:

- Jan. 29: A midair collision between a PSA Airlines Bombardier CRJ-700 and a U.S. Army Sikorsky UH-60 Black Hawk helicopter over the Potomac River near Washington Reagan National Airport (DCA). Sixty-four people aboard the airliner and the three aboard the helicopter were killed. Previous concerns had been raised about the proximity of helicopter routes to the DCA approach path and about maintaining required altitudes.
- Jan. 29: A Beechcraft 1900D carrying oil workers crashed en route to an oil field in South Sudan, killing 20 of the 21 people on board.
- Jan. 31: A Learjet 55 air ambulance flight crashed in Philadelphia shortly after takeoff, killing six people on board and one person on the ground, and injuring 19 others.
- Feb. 6: A Bering Air Cessna 208B Grand Caravan EX crashed while en route from Unalakleet to Nome, Alaska, killing all 10 people on board.
- Feb. 12: A Delta Airlines CRJ-900 crashed upon landing at Toronto Pearson International Airport during high winds and icy conditions. There were no fatalities, but some passengers sustained injuries.

These accidents, occurring in rapid succession, emphasize the need for an industrywide reassessment of safety policies, compliance efforts, and operational oversight. Flight Safety Foundation calls on regulators, air navigation service providers, airports, air operators, and manufacturers to take immediate steps to reinforce compliance with safety standards, strengthen safety management systems, and foster a safety-first culture that prevents further degradation of the global aviation safety system. Only through strict adherence to international regulations, rigorous training, and proactive risk management can the industry restore confidence and continue to ensure the safety of all who depend on air travel.

Additionally, recent serious incidents, particularly those involving runway incursions, are deeply concerning. A common thread across many of these incidents is deficiency in communication between pilots and controllers, including miscommunication and lack of situational awareness. These factors have played a role in runway incursions, abnormal runway contacts, and other significant operational risks.

To address these safety challenges, regulators and industry stakeholders should strengthen pilot-controller communication protocols and increase attention on training and procedures to prevent communication breakdowns. Also, the integration of Automatic Dependent Surveillance–Broadcast (ADS-B) technology into cockpit systems and controller displays offers a powerful tool to enhance situational awareness, particularly on the airport surface. Speeding up the adoption of ADS-B is crucial, as it can provide real-time position information that helps prevent safety lapses and supports safer, more efficient operations across the aviation system.

Airliner Accidents

Commercial airliners¹ of all types—jet-, turboprop-, and piston-engine aircraft—were involved in 15 fatal accidents in 2024, which resulted in 268 fatalities among passengers and crew and three ground fatalities. The fatality total is more than double 2023’s total of 110 passenger and crew fatalities (in nine fatal accidents), and is the largest since 2019, when there were 280 passenger and crew fatalities in 20 fatal airliner accidents. Six of 2024’s fatal airliner accidents occurred during scheduled passenger operations and five occurred in cargo operations. The others occurred in nonscheduled passenger operations.

Adding the 38 fatalities from the Azerbaijan crash, which is categorized in ASN as an unlawful interference event instead of an accident, and the five crewmembers from the Japan Coast Guard aircraft brings the year’s total fatalities in airliner-involved crashes to 311 passengers and crew.

Figure 1 shows the number of fatal airliner accidents from 1990 through 2024. The line represents the rolling five-year average.

Figure 1
Fatal Airliner Accidents, 1990–2024

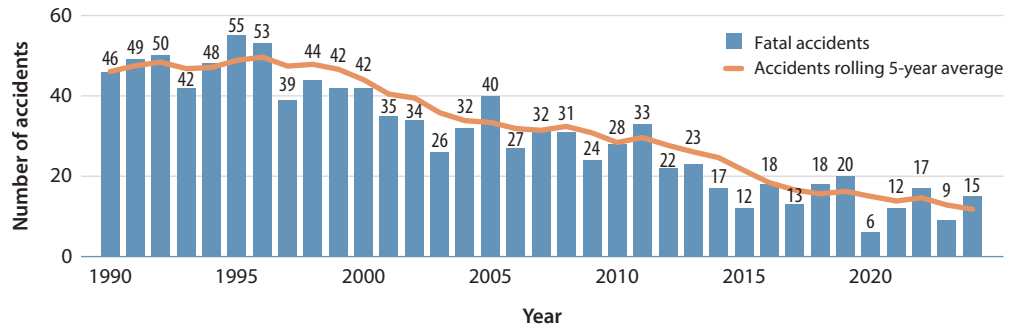
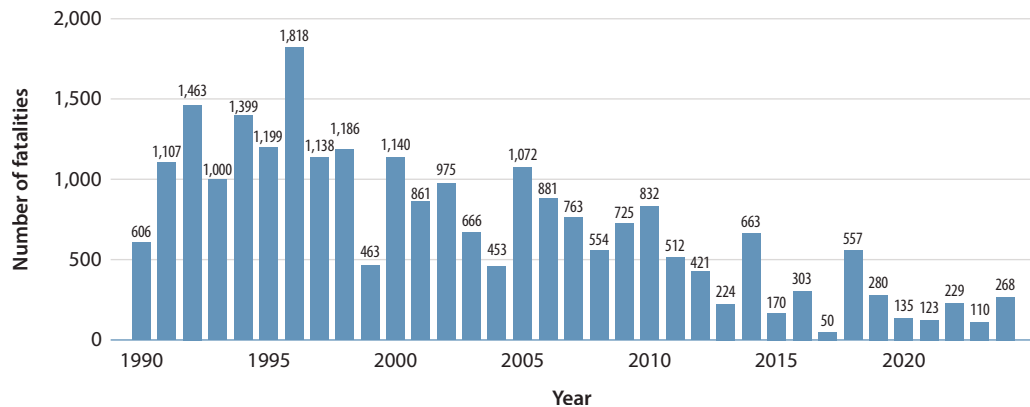


Figure 2 shows the number of airliner accident fatalities by year from 1990 through 2024.

Figure 2
Airliner Accident Fatalities, 1990–2024



¹ Flight Safety Foundation’s Aviation Safety Network defines an airliner as any aircraft model certified to carry more than 14 passengers. Most of these aircraft are jet- or turboprop-powered, but the dataset includes some piston-powered aircraft, such as the Douglas DC-4 and DC-3, and Antonov An-2. These older aircraft often are used in cargo operations.

Six of the 15 fatal airliner accidents last year involved jet airliners and resulted in 183 fatalities—the highest annual jet airliner figure since 2019, when 213 passengers and crew died in four accidents. The worst recent year in terms of both the number of fatal accidents and the number of fatalities was 2018, when jet airliners were involved in nine fatal accidents resulting in 376 fatalities among passengers and crew and 35 ground fatalities.

In 2023, the only fatality involving a commercial jet airliner occurred on Aug. 14 when the first officer on a LATAM Boeing 787 suffered a medical issue and died while the aircraft was in flight. The captain and a relief pilot landed the aircraft safely.

Eight of the fatal airliner accidents last year involved turboprop aircraft, resulting in 83 fatalities among passengers and crew and three people on the ground. The worst in terms of fatalities happened on Aug. 9, when an ATR 72-500 being operated by Voepass Linhas Aereas on a scheduled domestic flight in Brazil was destroyed when it crashed near Vinhedo, Sao Paulo, killing all 62 passengers and crew. The investigation is ongoing, but icing is suspected to have played a role in this loss of control-inflight (LOC-I) accident.

In the five-year period from 2019 through 2023, commercial jet airliners were involved in 13 fatal accidents resulting in 529 passenger and crew fatalities and six ground fatalities—the equivalent of 2.6 fatal accidents and 105.8 passenger and crew fatalities per year. During the period, there were two years—2021 and 2023—in which jet airliners were involved in a single fatal accident. In the same five-year period, turboprop airliners were involved in 44 fatal accidents, resulting in 323 fatalities among passengers and crew and eight people on the ground.

During the five-year 2019–2023 period, airliners of all types were involved in 64 fatal accidents, resulting in 877 fatalities among passengers and crew and 14 ground fatalities, or the equivalent of an average of 12.8 fatal accidents and 175.4 fatalities among passengers and crew per year. Scheduled passenger operations accounted for 22 of the fatal accidents, and cargo operations accounted for 24. A plurality of the fatal accidents (26) occurred during the en route phase of flight, while 15 occurred during the approach phase and nine during the landing phase.

Airliners of all types were involved in 132 accidents (fatal and nonfatal) in 2024. Approximately 64.4 percent, or 85, of the accidents occurred during scheduled passenger operations. Jet airliners accounted for 87 of the total accidents, or 65.9 percent of the total. In 2023, airliners of all types were involved in 105 accidents, 70 of which occurred during scheduled passenger operations and 19 in cargo operations. Jet airliners accounted for 74, or just over 70 percent, of the 105 total accidents in 2023.

In the five years from 2019 through 2023, airliners of all types were involved in 565 accidents, or an average of 113 per year for the period. Of those 562 accidents, 361, or slightly more than 64 percent, occurred during scheduled passenger operations, and 123, or 21.9 percent, occurred during cargo operations.

Most Frequent Accident Categories

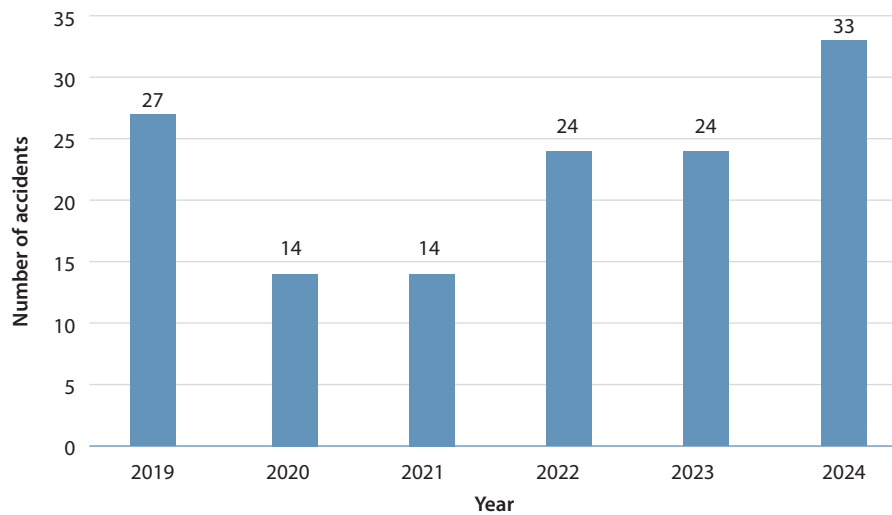
Turbulence: For the third year in a row, turbulence encounters were the most frequent accident type in 2024. Of the 132 airliner accidents last year, 33, or 25 percent, were related to turbulence, including one fatal accident. In that event, one passenger died and 30 people were injured when a Singapore Airlines Boeing 777-300ER encountered severe turbulence while en route from London Heathrow to Singapore. After the pilots were informed there were injured passengers in the cabin, the flight was diverted to Bangkok, where it landed safely.

Figure 3 (page 5) shows airliner turbulence-related accidents from 2019 through 2024.

The 33 turbulence accidents in 2024 represent the highest number in a single year since 1982. All of the turbulence-related accidents last year occurred in jet airliner scheduled passenger operations and all but one of them happened in the en route phase of flight, according to ASN data. Fifteen of the 33 accidents occurred in North America, the most for any region.

Figure 3

Airliner Turbulence-Related Accidents, 2024



Airliners were involved in 24 turbulence-related accidents in 2023 and in 2022. In the five-year, 2019–2023 period, there were 103 turbulence encounter accidents or an average of 20.6 per year. The worst year in the period was 2019, when there were 27 turbulence accidents. The number per year declined in 2020 and 2021 to 14 in each year, but reduced operations—particularly passenger operations—because of the COVID-19 pandemic could have played a role in that decline.

Runway Excursions: Runway excursions were the second most frequent accident type in 2024, with 20 airliner accidents, up from seven in 2023. Two of the 2024 accidents resulted in a total of four fatalities. On Jan. 18, a Fokker 50 on a cargo flight transporting humanitarian aid on behalf of the U.N. World Food Programme went off the runway at an airstrip in Somalia, and one of the pilots was killed. In the other accident, a de Havilland Canda DHC-5A on a cargo flight veered off the side of the runway at an airstrip in South Sudan and burst into flames. The pilots suffered minor injuries, but three people on the ground were killed.

Of the 20 airliner runway excursion accidents last year, 12 involved turboprops and nine involved jets. Thirteen of the accidents occurred in the landing phase and seven during takeoff. Eleven of the accidents occurred in the Africa region.

During the five-year 2019 through 2023 period, there were 76 runway excursion accidents, or an average of 15.2 per year. Seven of the 76 were fatal accidents resulting in 42 fatalities among passengers and crew and the death of one person on the ground. The worst of the seven accidents occurred on Sept. 16, 2023, when an Embraer EMB-110 operated by Manaus Aerotáxi landed in heavy rain at Barcelos Airport, Amazonas, Brazil. Twelve passengers and both pilots were killed when the aircraft ran off the runway and collided with a fence and an embankment.

Abnormal Runway Contact: The third most frequent airliner accident category in 2024 was abnormal runway contact (ARC), which ICAO defines as any landing or takeoff involving abnormal runway or landing surface contact.² The ASN database recorded 16 ARC accidents last year. The Jeju Air Boeing 737-800 accident on Dec. 29 is categorized as an ARC accident. None of the other 15 ARC accidents last year was fatal. Ten of the accidents occurred during scheduled

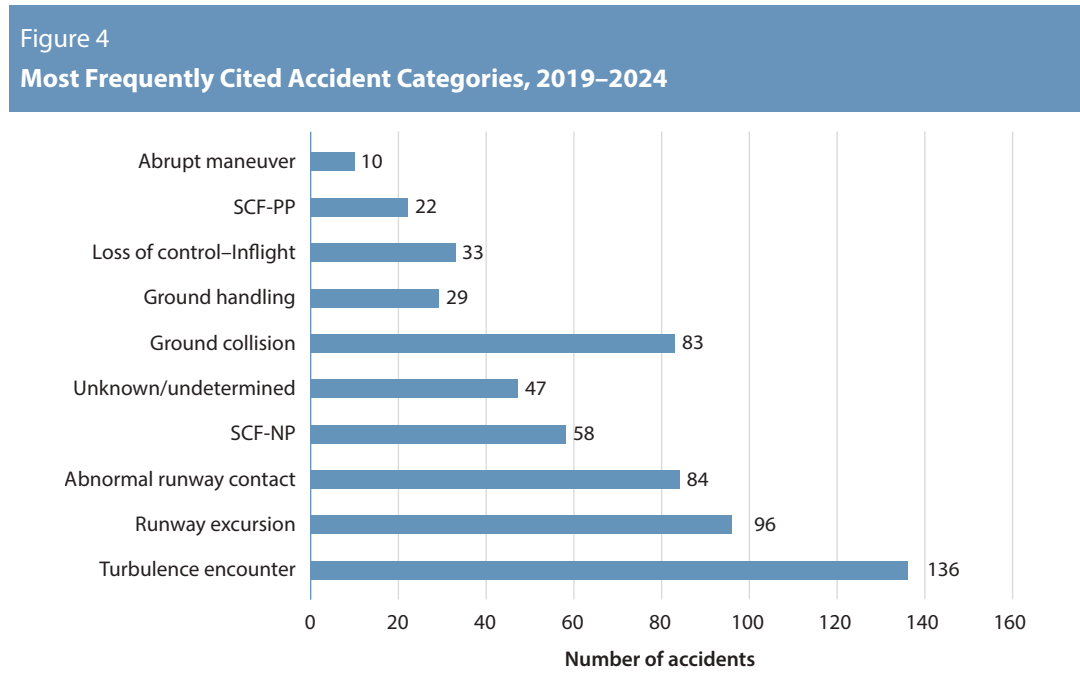
² Included in this category are events such as hard/heavy landings, long/fast landings, off center landings, crabbed landings, nose wheel first touchdowns, tail strikes, gear-up landings, and wingtip/nacelle strikes. If a system/component failure or malfunction led to the gear-up landing, the event is also coded under the appropriate system/component failure or malfunction category.

passenger operations, and 15 of the 16 occurred on landing. In 2023, airliners were involved in 14 ARC accidents; from 2019 through 2023, there were 67, for an average of 13.4 per year.

System/component failure or malfunction (non-powerplant): System/component failure or malfunction (non-powerplant) or SCF-NP, also was a frequently cited accident category. For the fourth year in a row, there were 11 SCF-NP accidents in 2024, none of which were fatal accidents. Seven of last year’s SCF-NP accidents involved jet airliners and six of the 11 occurred during scheduled passenger operations. The highest-profile SCF-NP accident in 2024 occurred on Jan. 5, when the left mid-exit door plug detached from the aircraft, leading to a rapid decompression.

Ground Collision: While turbulence, runway excursion, and ARC accidents were all up in 2024 over the previous year, the number of ground collision accidents declined from 15 in 2024 to nine in 2024; none of these accidents was fatal. From 2019 through 2023, there were 76 ground collision accidents, or an average of 15.2 a year. The worst recent year for ground collision accidents was 2019, when there were 28.

Figure 4 shows the 10 most frequently cited airliner accident categories for the period 2019 through 2024. These accidents account for the majority of all airliner accidents during the period.



SCF-NP = system/component failure–non-powerplant; SCF-PP = system/component failure–powerplant

In 2024, the 10 most frequently cited accident categories accounted for just under 90 percent of all the total accidents. In the 2019–2023 period, runway excursions, turbulence, ARC, ground collision, and SCF-NP represent 64 percent of all airliner accidents. The top 10 accident categories contain nearly 90 percent of all accidents. Included among these categories are the ones mentioned previously plus LOC-I, controlled flight into terrain, SCF-powerplant, overshoot/undershoot, and unknown. Most of the other categories have one or two accidents or none at all.

Corporate Jets

Corporate jets were involved in eight fatal accidents in 2024, resulting in 21 fatalities among passengers and crew and one fatality on the ground. The worst accident occurred March 10 when all five occupants of an Israel Aircraft Industries 1125 Astra SP were fatally injured in an accident

at Ingalls Field Airport in Hot Springs, Virginia, U.S. In 2023, corporate jets suffered nine fatal accidents, 39 fatalities among passengers and crew, and two ground fatalities.

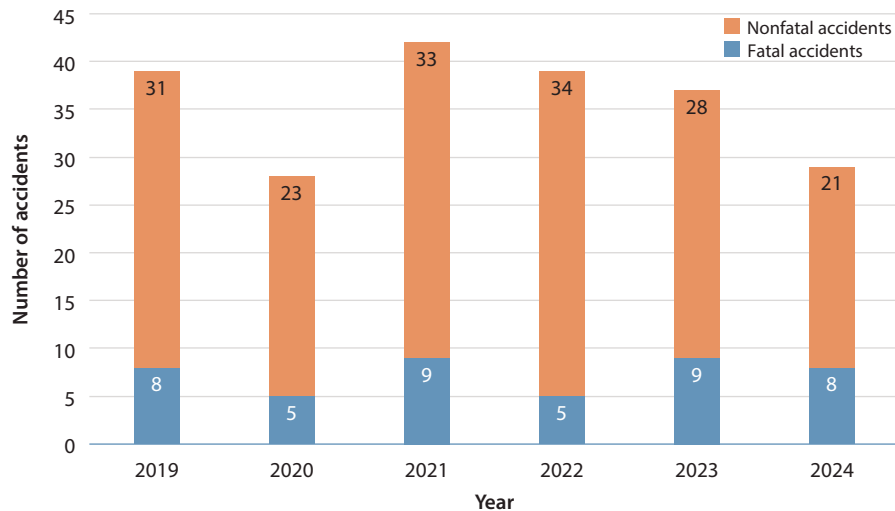
During the five-year 2019 through 2023 period, corporate jets were involved in 36 fatal accidents, or an average of 7.2 per year, resulting in 138 fatalities among passengers and crew, and four ground fatalities. Eighteen of the 36 fatal accidents occurred in North America and eight in South America. LOC-I was the most frequent ICAO occurrence category and was cited in 16 of the 36 fatal accidents, followed by runway excursions (six) and other/unknown (four).

In 2024, corporate jets were involved in 29 total accidents (fatal and nonfatal), 22 of which occurred in North America and five in South America. Fourteen of the accidents occurred during the landing phase, and 17 were classified as runway excursions. In 2023, corporate jets were involved in 37 total accidents, 26 of which occurred in North America. Fourteen of the total accidents were classified as runway excursions and six were loss of control.

During the five-year period, corporate jets were involved in 185 total accidents, or an average of 37 per year, with 120 of the accidents occurring in North America, 23 in South America, and 16 in Europe. Nearly 56 percent, or 103, of the total accidents occurred during the landing phase of flight.

Figure 5 shows all corporate jet accidents from 2019 through 2024.

Figure 5
Corporate Jet Accidents, 2019–2024

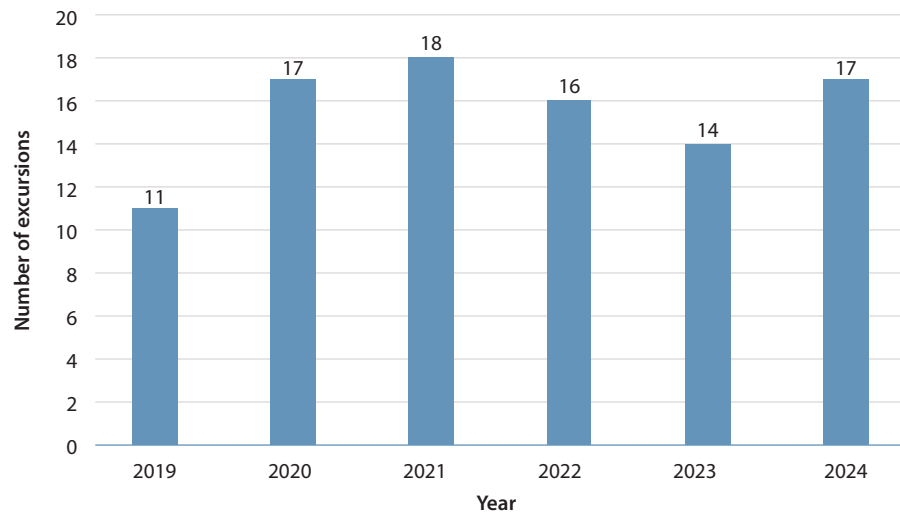


Given the number of accidents that occurred during the landing phase, it should not be a surprise that by far the most frequent ICAO occurrence category during the period was runway excursion, with 76 accidents, or an average of 15.2 per year, accounting for 41 percent of all corporate jet accidents. Six of the 76 runway excursion accidents were fatal accidents, resulting in 19 fatalities among passengers and crew and one person on the ground.

Figure 6 (page 8) shows corporate jet runway excursions from 2019 through 2024.

The next most frequently occurring category from 2019 through 2023 was LOC-I, which saw 27 accidents during the period or an average of 5.4 per year. Sixteen of the 27 LOC-I occurrences were fatal accidents, resulting in the deaths of 75 passengers and crew and two people on the ground. There were two LOC-I accidents in 2024, both of them fatal accidents resulting in four deaths among passengers and crew.

Figure 6
Corporate Jet Runway Excursions, 2019–2024



Abnormal runway contact accounted for 16 accidents during the five-year 2019–2023 period, but there were no abnormal contact accidents last year. SCF-NP accounts for the 14 accidents in 2019–2023, or an average of 2.8 per year during the period. There were two SCF-NP accidents in 2024. The worst year in the past six years for SCF-NP accidents was 2022, when there were eight.

ASN Accident Dashboard

The Foundation has created a series of interactive dashboards that enable users to interact with the ASN data. The dashboards cover airliner and corporate jet accidents and include links to the relevant accident summaries in ASN. The dashboards can be [found here](#) on the Foundation’s website.