

5. Causes of Accidents

Categorizing the direct causes of 54 accidents, "decrease in airspeed/stall" accounted for 16 (30%), followed by "contacts with property (during flight)" in 9 (17%) and "decrease in engine power/engine stop" in 7 (13%) (see Fig. 10).

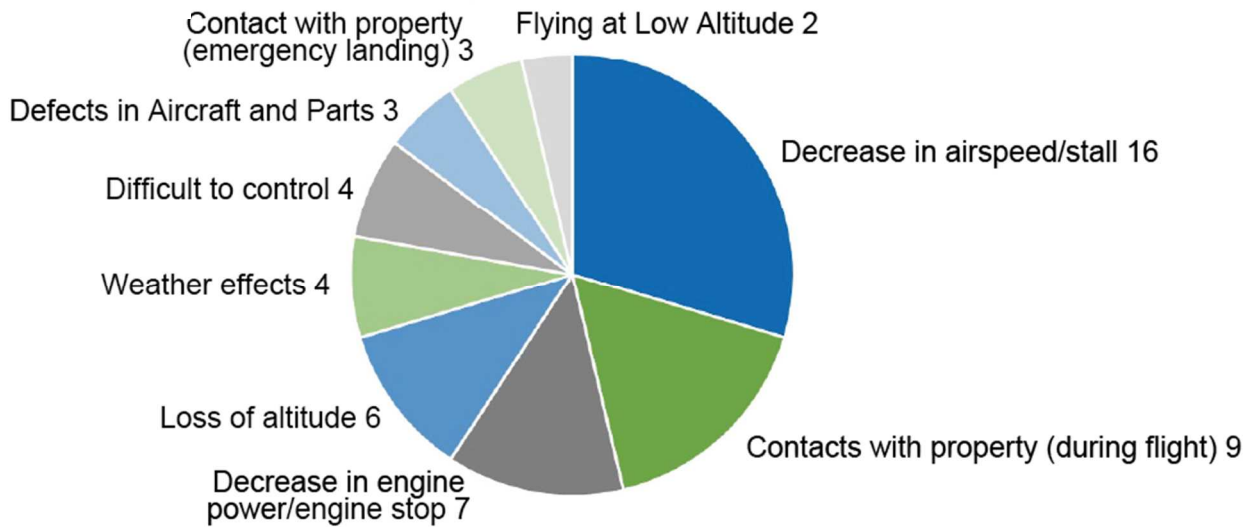


Figure 10 Causes of Accidents

3. Tips for Safe Enjoyment of the Sky ~Analysis of Factors That May Have Contributed to the Accidents~

To safely enjoy flying, it is enough to avoid the situation that caused the accident, but to do so, it is effective to focus on the factors behind the cause (safety risks) and take action to reduce those risks. It is also important to consider what needs to be done for safety from multiple perspectives, as a single accident may involve multiple factors.

In this chapter, we will consider what can be done to reduce risk during flight based on factors that may have had a role in the cause.

In the investigations of the 54 accidents analyzed in this study, 11 major factors were identified that may have played a role in the causes of the accidents (see Table 2). "Improper maneuvering" was a factor in 40 accidents, while "weather effects" and "lack of knowledge, skill, and experience" each accounted for 19 accidents. When several factors are involved in a single accident, the total is higher than the 54 accidents because the number of cases is counted for each of the several factors.

Improper piloting	40	Lack of Detection, Recognition and Knowledge	6
Weather effects	19	Flying at Low Altitude	6
Lack of Knowledge, Skill, and Experience	19	Deviation from Operational Limits and Lack of Checks	6
Defects in Aircraft and Parts	12	Flight Characteristics	3
Flawed Safety Management	11	Improper Assembly	2
Improper Inspection and Maintenance	9	Others	6

Table 2 Factors That Probably Played a Role in the Accidents

While reviewing the contents of these factors, we will consider ways to reduce safety risks, etc.

1. Improper Piloting

Improper maneuvering	
Response to and Control of Flight	12
Operation of Three Rudders (Rudder, Elevator Rudder, Auxiliary Wing)	10
Engine Operation	9
Sudden Maneuvering	5
Control of Speed	3
Others	1
Total	40

Forty accidents were identified in which improper maneuvering was a contributing factor.

Specifically, there were cases of inappropriate control of the aircraft, such as handling of attitude disturbance and deflection and excessive angle of descent; inappropriate pitch bank and throttle maneuverings; and operations that resulted in abrupt movements, such as steep turns.



Tips for Safety

- Maintaining a stable attitude and speed is a prerequisite for safety.
- Always keep the attitude of the aircraft and operate the throttle carefully, so as not to reach a condition that would require sudden maneuvering.

2. Weather (Wind)

Weather effects	
Tail Winds	6
Turbulent	5
Crosswinds	4
Gusts	1
Head Wind Speed Limit Exceeded at	1
Rainfall	1
Failure to Maintain Visible Weather	1
Total	19

Nineteen accidents were identified which has a metrological factor. Only two involved rainfall or clouds, and most were wind-related factors such as tailwinds, turbulent airflow, and crosswinds.



Tips for Safety

- Ultralight planes, etc. are more susceptible to the effects of wind due to their lighter airframe and slower flight speeds.
- Therefore, accurate understanding and prediction of unseen wind conditions are one of the most important factors for safe flight.



Tips for Safety (continued)

- Create a flight plan by gathering information on the wind conditions at the takeoff/landing site as well as the wind characteristics (including seasonal winds) in the area surrounding the takeoff/landing site. Always be aware of wind conditions while flying.

3. Lack of Knowledge, Skill, and Experience

Lack of Knowledge, Skill, and	
Lack of Familiarity with Aircraft	7
Insufficient Maneuvering Skills	5
Lack of Manual Checking	5
Lack of Knowledge Required for	2
Total	19

In order to properly operate the aircraft at all times, it is necessary to have the knowledge, skill, and experience appropriate to the stage of flight, and we were able to identify 19 accidents in which this was a factor.

Specifically, blanks in-flight experience, lack of familiarity with the new aircraft, insufficient pilot skills of trainees, and failure to check flight manuals and other documents were cited, as well as instances where trainees did not have access to manuals on flying and maintenance.

In addition, seven cases resulted in accidents due to unintentional takeoffs and ascents during jump flight training, etc.



Tips for Safety

- It is essential to read and understand the manuals issued by the manufacturer, etc., and to fly in accordance with the manuals, in order to protect your life.
- Trainees should be careful not to take off unintentionally.
- It is important for the flight instructor to plan the flight training by providing instructor-on-board training in the basic operations of the aircraft and by determining whether the trainee has the necessary skills for solo flight.
- Even after acquiring a certain level of skill, accidents can still occur when the pilot flying after a long time or operating an aircraft that the pilot has never operated before. Therefore, you should carefully check the aircraft's kinematics and other characteristics each time you fly, and plan your flight according to your recent flying experience and the weather conditions on the day of the flight to ensure that you have enough margin for safety.

4. Malfunction of Airframe or Parts, Improper Inspection or Maintenance

Defects in Aircraft and Parts		Improper Inspection and Maintenance	
Engine	4	Violation of Manuals, etc.	6
Airframe	3	Ignition System	1
Flight Controls	2	Propeller	1
Fuel System	2	Airframe	1
Propeller	1		
Total	12	Total	9

We were able to identify 12 accidents in which airframe or component failure was a contributing factor, and nine accidents in which improper inspection or maintenance was a contributing factor. Failures occurred in various parts of the aircraft, including the engine, airframe, flight controls, fuel system, and propeller.

In addition, there were 14 cases where modifications that did not conform to the manual were noted.



Tips for Safety

- As mentioned in Chapter 2, accidents involving ultralight planes, etc. often result in fatalities or serious injuries. Therefore, it is necessary to take all possible measures for maintenance on a routine basis.
- In addition to aircraft assembly work, works that do not conform to the official manuals, etc., as specified by the manufacturers, etc., such as failure to carry out inspections/maintenance work and regularly scheduled inspections, and repair work using substitute products, are one of the factors that may cause an accident.
- Gradual changes over time, such as corrosion of parts, wear and loosening of fasteners, can lead to accidents.
- Before and after the flight, carefully inspect and maintain the aircraft in accordance with the authorized manuals, paying close attention to even minor anomalies or changes in condition

5. Others

Other factors included failure to visually recognize obstructions such as trees, power lines, etc., and deviated or unidentified weight/center of gravity positions.



Tips for Safety

- In the case of ultralight planes, etc., deviation from the weight and center of gravity position may have a significant impact on flight characteristics. Check to see if the weight and center of gravity are within the proper range.
- Trees, power lines, etc., which are easily visible on the ground, are difficult to see during flight. Therefore, it is important to confirm the location of obstacles in advance with drawings, etc., and to monitor the outside of the aircraft carefully during flight.
- Observe the safety management regulations and properly wear seat belts, helmets, and life vests.

The report also pointed out many violations of laws and regulations, such as not obtaining the necessary Civil Aeronautics Law permits for flights of ultralight-powered aircraft, etc. (airframe (proviso of Article 11-1 of the Civil Aeronautics Law), pilot (Article 28-3 of the same), and takeoff/landing site (proviso of Article 79 of the same)) and not satisfied the permission conditions.

In the 54 accidents analyzed in this study, we were able to identify these observations in 39 cases (72%).



Tips for Safety

- These permits are not imposed merely as an obligation, but as a pathway to ensure safety for those who enjoy the sky. Be sure to obtain a permit and comply with the conditions of the permit.
- The application details required by the Civil Aeronautics Law are a concrete checklist to protect the lives of passengers. Follow the application items and make careful preparations for safe enjoyment of the sky.