

AFA21 Occurrence Investigation

Executive Summary

On May 5, 2016, a Diamond DA-40NG aircraft, registration number B-88002, operated by APEX flight academy (APEX), takeoff from Taitung Fung-Nian Airport with one student pilot on board, performed his third solo flight, the subject of area solo training. The aircraft took off at 0801 from runway 04 of Fung-Nian Airport and follow VFR departure to the designated area of the East Rift Valley, maintain approximately 4,000 feet to conduct the training.

While the flight completed its training subjects back to the airport, the tower informed pilot the wind direction of 180 degree, wind speed of 7 nautical miles per hour, and the runway 04 in use. Because the wind was beyond the student pilot's solo limit, the student pilot asked and approved by the tower to use runway 22 full stop landing. The attitude and speed of the aircraft did not meet the stable standard in the final approach, and bounce occurred in the landing process, the nose gear broke off from the fuselage, the propeller and engine cowl sustained damage afterward. The aircraft stopped on the runway, the all personnel on board were safe.

In accordance with the Aviation Occurrence Investigation Act, Republic of China (R.O.C) and the content of Annex 13 to the Convention on International Civil Aviation, which is administered by the International Civil Aviation Organization (ICAO), the Aviation Safety Council (ASC), an independent agency of the ROC government responsible for civil aviation occurrences investigation, after confirmation of this occurrence, organized a team to conduct the investigation. The investigation team also included members Civil Aeronautics Administration R.O.C and APEX.

The Investigation Draft Report accomplished on January 2017 and the final draft was send to parties for comments after the approval at the 54th Council Meeting on February 21, 2017. The final draft report was integrated by parties' comments and approved by the ASC council members on March 28, 2017, at the 55th Council Meeting. The investigation Report was published on May 2, 2017.

There are 9 findings and 9 safety recommendations are concluded after this investigation.

Findings as the result of this investigation

The ASC presents the findings derived from the factual information gathered during the investigation and the analysis of the occurrence. The findings are presented in three categories: **findings related to probable causes**, **findings related to risk**, and **other findings**.

The **findings related to probable causes** identify elements that have been shown to have operated in the occurrence, or almost certainly operated in the occurrence. These findings are associated with unsafe acts, unsafe conditions, or safety deficiencies associated with safety significant events that played a major role in the circumstances leading to the occurrence.

The **findings related to risk** identify elements of risk that have the potential to degrade aviation safety. Some of the findings in this category identify unsafe acts, unsafe conditions, and safety deficiencies including organizational and systemic risks, that made this occurrence more likely; however, they cannot be clearly shown to have operated in the occurrence alone. Furthermore, some of the findings in this category identify risks that are unlikely to be related to the occurrence but, nonetheless, were

safety deficiencies that may warrant future safety actions.

Other findings identify elements that have the potential to enhance aviation safety, resolve a controversial issue, or clarify an ambiguity point which remains to be resolved. Some of these findings are of general interests that are often included in the ICAO format accident reports for informational, safety awareness, education, and improvement purposes.

Findings Related to Probable Causes

1. The student pilot did not establish the appropriate pitch attitude and deceleration, so that the aircraft touchdown with the negative pitch angle, causing the aircraft to bounce, and the student pilot did not go around immediately, and the aircraft was porpoising, resulting in the nose gear broken.

Findings Related to Risk

1. The occurrence student pilot's traffic pattern operation, including speed, attitude and descent rate were not stable, affecting the following stability of the normal operation and workload. On the final approach stage, the aircraft was above the glide path, the speed was higher than the approach speed and not stable. When the altitude reached 200 feet, the aircraft did not meet the standard of stable approach, and the student pilot did not perform go around.
2. The APEX's mission briefing procedures and contents are incomplete; it may affect the response and handling ability of the trainee in the event of the situation change.
3. The lack of confidence, easy to tense and insufficient multi-task handling abilities of occurrence student pilot were still not improve

even through the additional training. It showed that the relevant training content did not completely improve his stabilities of flight control.

4. The APEX Manual has a mechanism to monitor students' solo flights. However, the trainees may not be able to acquire immediate assistance if they encounter any abnormal conditions during the takeoff and landing phase.

Other Findings

1. The flight crew were certificated and qualified in accordance with Civil Aeronautics Administration (CAA) regulations. There was no evidence to indicate that the flight crew's performance might have been adversely affected by alcohol during the occurrence flight.
2. There is no evidence to show that the accident was relate to airworthiness and the weight and balance of the aircraft.
3. The occurrence student pilot did not acquire adequate techniques of traffic pattern operations to control the speed and glide path at the initial training; it may increase the difficulties during the unfamiliar traffic pattern operations.
4. The APEX traffic pattern training contents are illustrated in words and figures in different manuals but incomplete, although complementary one another, but unfavorable for trainee to read and cross check in operation.

Safety Recommendation

To APEX Flight Academy

1. For student pilot who are required to receive additional training, their

training content, course and times should be deliberately consider in order to effectively improve their related operational techniques.

2. Establish appropriate mission briefing procedures and contents to improve the trainees' ability to cope with the situation change.
3. To improve the current monitoring mechanism for solo students, so that the student pilot could obtain immediate and effective assistance during takeoff and landing in case of the abnormal conditions.
4. Establish clear “stable approach” criteria, and emphasized its importance and necessity.
5. Clearly define the traffic pattern key point altitude, speed and related distance between the runway threshold in the flight training manual, to facilitate the cross check of student pilot.
6. Re-examine the aircraft pilot training course, the criteria for terminate the training

To Civil Aeronautics Administration, MOTC, Taiwan

1. Supervise APEX to draft the appropriate mission briefing procedures and contents to improve the trainees’ ability to cope with the situation change.
2. Supervise APEX to improve the current monitoring mechanism for solo students, so that the student pilot could obtain immediate and effective assistance during takeoff and landing in case of the abnormal conditions.
3. Supervise APEX to re-examine the aircraft pilot training course, the criteria for terminate the training