

CI704 Occurrence Investigation

Executive Summary

On October 1st, 2016, China Airlines scheduled passenger transport flight CI704, an Airbus A330-300 aircraft, registration number B-18307, executed the mission from Manila International Airport to Taoyuan Airport. There were 2 flight crew members, 11 cabin crew members and 124 passengers, totally 137 people on board. At 1927 hour, the aircraft experienced a tail strike when performed a reject landing on the 23R runway of Taoyuan Airport. At 1959 hour, the aircraft safe landed on the runway 05R of Taoyuan Airport with no injury but aircraft belly skin and structure damaged.

According to the Republic of China (ROC) Aviation Occurrence Investigation Act, and the content of Annex 13 to the Convention on International Civil Aviation, the Aviation Safety Council (ASC), an independent aviation occurrence investigation agency, was responsible for conducting the investigation. The investigation parties invited to participate in this investigation included: Bureau d'Enquêtes et d'Analyses, France (BEA), Airbus aircraft company, Civil Aeronautical Administration, ROC (CAA) and China Airlines.

The draft “Final Report” was completed in July 2017. The report was submitted to the relevant parties for comments after being reviewed by the 61st council meeting on September 26th, 2017. Upon compilation and integration of comments from parties, the Final Report was approved by 64th ASC Council Meeting on December 27th, 2017. The Final Report was published on January 31st, 2018.

There are a total of 11 findings from the “Final Report”, and 6 safety recommendations issued to the related organizations.

Findings as the result of this investigation

Findings related to probable causes

1. The attention allocation and situational awareness of the Instructor Pilot were probably affected by the training Captain’s nose-holding tendency after touchdown addressed in the training record, so that he focused too much on the aircraft’s attitude but neglected to monitor critical information during landing as a pilot monitoring should do. For this reason, the Instructor Pilot was neither aware of the “REV” indication on the Engine/Warning Display page nor the position of reverse thrust levers, thus as a result neither held the status of thrust reverser in hand nor used it to make decision on whether to continue or reject the landing while taking over the flight control.
2. In order to get the aircraft airborne promptly, the Instructor Pilot pulled the side stick full back after taking over the flight control and held that position until the aircraft started to rotate. In the mean time, forward thrust was unable to increase at once since thrust reversers were not in stowed and locked position yet, and the air speed continued to drop while deceleration devices kept functioning. Subsequently under the combination effects of deceleration devices stopped functioning, engine power sharply increased, and the pitch trim position was higher than normal setting, the Instructor Pilot’s full back side stick input caused the aircraft to pitch up rapidly. Though the Instructor Pilot had released the side stick input accordingly, however it didn’t overcome the dramatic pitch up tendency. The excessive rotation rate and high pitch during lift-off then led to the

loss of tail section clearance, the tail strike, and the damage to the aircraft.

Findings related to risk

1. Although the Instructor Pilot commenced the go-around right after his taking over of the aircraft, the call out was made until the main landing gear had lifted off. This delay resulted in the training Captain's unawareness of Instructor Pilot's intension, so that he did not fill the role of pilot monitoring, dispute the nonconforming go-around decision in time, monitor or call out to assist Instructor Pilot in the operation of configuration, power setting, attitude, and speed.
2. In the occurrence flight, the Instructor Pilot did not take advantage of his professional knowledge and experience to develop an effective situational awareness against the non-normality in the dynamic flight training environment so as to elevate the judging and handling ability for abnormal situation.

Other findings

1. The occurrence flight crew were properly certificated and qualified in accordance with the Civil Aeronautics Administration and company requirements. No anomaly with respect to the occurrence was found in the training record. No evidence indicated any preexisting medical conditions that might have adversely affected the flight crew's performance during the occurrence flight.
2. The flight crew's 72 hours activities prior to the occurrence were normal. The level of fatigue did not influence their performance.
3. At the time of the occurrence, the weather condition and weight and

balance were both within the aircraft's limitation.

4. The operations and status of the aircraft on the final approach met China Airlines' stable approach criteria.
5. The flight crew's response to the abnormal condition after the occurrence was in compliance with related procedures.
6. The airworthiness and maintenance of occurrence aircraft were in compliance with company standards and current civil aviation regulations. There were no aircraft system or engine malfunctions that would have prevented normal operation of the aircraft.
7. The occurrence aircraft belly skin was chafed or worn out from fuselage Frame 74 to Frame 83 and Stringer 53 L to Stringer 54R. Internal structure deformed at Frame 79; frame clips deformed at Frame 78 and Frame 75.

Safety recommendation

To China Airlines

1. Reinforce education and training to ensure flight crew familiar with and abide by the standard go-around procedures in company and manufacture's manuals. Also, ensure flight crew heighten their situational awareness toward air speed, attitude, configuration, deceleration devices, power setting, as well as remaining distance of the runway before making go-around decision, and thoroughly evaluate the adequacy and risk of a go-around prior execution, so that to prevent the tail strike occurrence from happening.
2. Reinforce education and training of the Instructor Pilots to prevent the inappropriate maneuvers presented in the occurrence, prevent them

from overemphasizing trainee's operation with the result that neglect to fill the role of pilot monitoring. Also, ensure their ability to pose effective situational awareness against the dynamic flight training environment, so as to prepare for abnormal situation throughout the flight.

3. Take occurrence scenario for example and tailor particular courses in the crew resource management training to strengthen the standardization of flight operations during landing, standard call out, flight crew's situational awareness, communication and decision making while exchanging the flight duty. Moreover, especially reemphasize the importance to verify the status of thrust reversers after main gear touchdown, and the strict policy of making a full stop as the thrust reversers have been deployed.

To Civil Aeronautics Administration, Ministry of Transportation and Communications

1. Supervise and ensure that China Airlines reinforces education and training to ensure flight crew familiar with and abide by the standard go-around procedures in company and manufacture's manuals. Also, ensure flight crew heighten their situational awareness toward air speed, attitude, configuration, deceleration devices, power setting, as well as remaining distance of the runway before making go-around decision, and thoroughly evaluate the adequacy and risk of a go-around prior execution, so that to prevent the tail strike occurrence from happening.
2. Supervise and ensure that China Airlines reinforces education and training of their Instructor Pilots to prevent the inappropriate maneuvers presented in the occurrence, prevent them from

overemphasizing trainee's operation with the result that neglect to fill the role of pilot monitoring. Also, ensure their ability to pose effective situational awareness against the dynamic flight training environment, so as to prepare for abnormal situation throughout the flight.

3. Supervise and ensure that China Airlines takes occurrence scenario for example and tailor particular courses in their crew resource management training to strengthen the standardization of flight operations during landing, standard call out, flight crew's situational awareness, communication and decision making while exchanging the flight duty. Moreover, especially reemphasize the importance to verify the status of thrust reversers after main gear touchdown, and the strict policy of making a full stop as the thrust reversers have been deployed.