

# China Airlines Flight CI 687 Occurrence Investigation Report

## **Executive Summary**

On September 20, 2008, China Airlines passenger flight 687, a Boeing B747-400 aircraft, B-18211, took off from Taoyuan International Airport at 09:34 Taipei time for Ngurah Rai International Airport (DPS), Bali, Indonesia, with 2 pilots, 17 cabin crew and 339 passengers. At 11:27, the aircraft encountered severe turbulence en route M764 near Waypoint LULBU, which led Purser and 2 passengers be seriously injured, and 3 cabin crew and 19 passengers slightly injured. The aircraft landed at Ngurah Rai International Airport at 14:03 and the injured were sent to hospitals for treatment.

## **Findings Related to Probable Causes**

1. After the weather radar was switched from manual mode back to auto mode, the weather information stored previously could not be shown from the display. At that time with poor visibility outside condition was not available. The display only showed the green status when the intensity of radar beam reflecting to thunderstorm had become weak. Pilots did not correctly use radar according to its characteristics; which led the aircraft yield towards west side and fly into South China Sea thunderstorm area formed by tropical depression then encounter of severe thunderstorm turbulence.
2. The passengers and cabin crew were injured because they did not fasten seat belt during turbulence.

## **Findings Related to Risks**

1. The possible reasons why the passengers were injured by not having fastened seat belt during occurrence may be: passengers did not do as per cabin crew's request, they were not found without seat belts on during cabin security check, or passengers un-buckled seat belts after cabin crew's check.
2. The possible reasons why cabin crew was injured by not having fastened seat belts during occurrence may be: they did not follow procedures to be seated or before verifying if it was safe to get up to work.

3. The descriptions of the airline's Cabin Crew Operation Manual is not consistent concerning the 'definition' of turbulence prevention and handling, procedures of 'predicable turbulence', and the requirement to cabin crew to respond when the aircraft encounters 'moderate or more severe turbulence'. Besides, the definition of 'predicable turbulence' and 'unpredictable turbulence' is not fully described.
4. It implies of inconsistency in the airline's Flight Operation Manual and Cabin Crew Operation Manual concerning some procedures as how to deliver turbulence information.
5. Purser found shelter at galley area then communicated with cockpit and started the galley preparation work before turbulence started; which might have influenced nearby cabin crew who needed to leave their seats for assistance. At the same time when passengers saw nearby cabin crew unbuckled seat belts and walking around, they might regard there was no need to fasten their seat belts; which increased the safety risk.
6. Pilots and cabin crew had poor communications concerning turbulence pre-warning situation for cabin crew to go back to seat with seat belt fastened to allowing cabin crew to continue their work again. The airline's relevant manuals failed to set up the standard terms or to provide relevant guidelines.
7. When there were more injured people in cabin together with some cabin crew disabled, the airline failed to delegate deputies and re-organize job responsibilities, in order to have effective response to the situation.

### **Other Findings**

1. The flight crew's license met with civil aviation regulations. The daily routine within 72 hours prior to the occurrence was normal and no evidence showed any affects from medication and alcohol.
2. The Significant Meteorological Information (SIGMET) reporting procedure of CAL's Flight Operation Manual was not fully compliance with ICAO Doc 4444. After the aircraft encountered severe turbulence, it was reported to the local ATC authorities where turbulence occurred.

3. If the airline could add more guidelines for handling and evacuating more injured people, the involved personnel would have something to consult and follow.
4. The number of 4 national turbulence occurrences in recent 10 years counts for 12.1% of 33 'civil air transportation' 'non-fatal' flight occurrences that occurred during the same period yet caused 83.% of injured people in that classification. In the turbulence related occurrences, 58 cabin crew-members were on duty, and half of the crew was injured. Among those cases, the issues related to injury caused by seat belts not fastened are as the following:
  - (1) In most of the cases, after the turbulence warning the chance to encounter a severe turbulence was not high, so passengers neglected 'FSB' (Fasten Seat Belt) indication light and related broadcast and have lower alertness and preparation.
  - (2) The airline did not fully make it clear at each flight concerning regulations related to the cabin crew's responsibilities to fasten seat belts, passenger's obligations, the warning from the analysis of the past casualties statistics.
  - (3) To release notifications to emphasize the turbulence injury was usually working in a short time.

## RECOMMENDATIONS

### To China Airlines

1. Reinforce the requirement and tests to pilots to familiarize weather radar's 'User guide'. (ASC-ASR-10-10-001)
2. Review the regulations in Flight Operation Manual related to reporting SIGMET in the air and mandate pilots to actually perform. (ASC-ASR-10-10-002)
3. Review relevant crew operation manuals, training and checks concerning turbulence prevention and handling procedure in cockpit and cabin; which should be simple, clear and consistent to be effectively followed, including:
  - (1) Implement and reinforce the procedures and implementation skills for cabin crew to check on passengers to ensure seat belt fastened.
  - (2) Set up cabin crew's responsible area and moving line for security check.

- (3) Review and implement the procedure of deputy delegation when cabin crew are disabled.
- (4) Add an additional handling and evacuation guideline when there are people injured in the cabin.
- (5) Implement the procedure that cockpit initiate to inform cabin crew of predicable turbulence information.
- (6) Set up clear instructing procedures and standard terms for pilots to dismiss the situation of moderate or more severe turbulence.
- (7) Add a procedure for the crew to inform passengers of the airline's policies to handle turbulence and the statistics of the previous events.
- (8) Reinforce CRM training. (ASC-ASR-10-10-003)

To Civil Aeronautics Administration, Ministry of Transportation and Communications

1. Reinforce that it is implemented for passengers to fasten seat belts, for example: to request the airline to promote the advice to passengers at each flight, to reinforce cabin audit and to have regular review for the results. (ASC-ASR-1010-004)