Executive Summary

On December 13th, 2018, a China Airlines Boeing B747-409F freighter, registration number B-18717, departed from Hong Kong International Airport to Taiwan Taoyuan International Airport (RCTP) for a schedule cargo service flight CI6844 with 1 pilot and 1 first officer on board. Next day, the flight landed at 0019:46 on the runway 05L at RCTP. The aircraft landed at the pre-threshold area which is 21 meters away before the runway threshold. There are 3 of the runway end identifier lights were damaged during this flight, no one was hurt on board.

According to the Transportation Occurrence Investigation Act of the Republic of China, and the content of Annex 13 to the Convention on International Civil Aviation, the Taiwan Transportation Safety Board (TTSB), an independent transportation occurrence investigation agency, was responsible for conducting the investigation. The investigation parties invited to participate in this investigation included: National Transportation Safety Board (NTSB), Boeing aircraft company, Civil Aeronautical Administration (CAA), ROC and China Airlines. The final draft report was reviewed and approved by TTSB's 9th Board Meeting on March 6th, 2020.

There are a total of 11 findings from the Final Report, and 5 transportation safety recommendations issued to the related organizations.

I. Findings as the result of this investigation

Findings related to probable causes

1. The operation of the pilot-flying, first officer, was not able to

adequately control and use between both of the pitch attitude of the aircraft and the power lever to maintain the aircraft in the glide slope with proper attitude during approach at this flight, the improper timing of the landing flare and inadequate power lever controlling led a hard landing outside the touchdown zone, these indicated the ability of the manual landing control did not meet the safety landing standards.（1.11, 2.4.1）

2. The pilot monitoring, pilot-in-command, was not able to stay in vigilant during approaching and landing operation of the junior pilot-flying at this flight, When the aircraft had an abnormal situation, it was too late to take-over the operation or called out go-around, it caused the hard landing. （2.4.2、2.4.3、2.4.4、2.5.1）

Findings related to risk

1. The planning or the execution of "Junior Capt/FO Proficiency Monitoring Program" was not able to effectively manage the operations of the manual landing stays within the safe landing boundaries. （2.4.3）
2. The runway exposed in the risk of foreign object contamination inasmuch as the occurrence flight crew did not exactly report the situation they encountered to the tower and China Airline after landing.（1.18.2, 2.6）

Other findings

1. The occurrence flight crew were qualified by Civil Aeronautics Administration with valid airman certification and medical examination, were also in compliance with the requirements of China

Airlines, there is no abnormal finding from the training and check records related to this occurrence. There was no evidence indicating the performance of the flight crew were influenced by any preexisting medical conditions or alcohol effects during the occurrence flight. （1.5、2.1）

2. After the occurrence happened, the aircraft continued to perform flight missions after changed the two of main tires. The cockpit voice recorder did not contain information related to the occurrence. (1.11.2, 1.16.2)
3. The occurrence flight did not subject to serious wind-shear or turbulence at radio altitude below 2,000 feet during landing. （1.7、2.2.1、2.2.2）
4. The radio altitude auto callout advisory could not be issued since the audio ability was being occupied by another GPWS aural alert voice, “Sink Rate”, at radio altitude below 100 feet. （2.3）
5. The weather condition and the aircraft weight and balance condition were within the landing limitation of the occurrence aircraft model during the occurrence occurred. （1.6.2、1.7、2.1）
6. The pilot-in-command possibly subjected to a few fatigue facts, such as short-term sleep deprivation, poor sleep quality and long continuous awaking time during the occurrence occurred, those could possibly lead symptoms of cognitive fatigue on awareness and reaction. （1.5.2.1、1.16.1、2.5.1、appendix 4）
7. There was no finding on the taxiway N1 and runway 05L after field check after the Taiwan Taoyuan International Airport Co. Ltd. was reported the situation of the foreign objects on the paved way, it could be possibly due to the jet blast, which produced before take-off by the flight CI061 and blown the damaged runway end identifier lights into

the grass. （1.18.3、2.6）

II. Transportation Safety Recommendation

To China Airlines

1. Enhance the ability of manual landing operations to junior pilot.
2. Require the pilot-in-command, if and when the flight collaborates with a junior pilot, must stay in vigilant during approaching and landing operation, and taking over the control at proper timing or request a go-around as the relevant regulation requested once the aircraft encountering in suboptimal situation for the landing safety.
3. Reevaluate the planning and the execution of “Junior Capt/FO Proficiency Monitoring Program” to fulfill the program effectively.

To Civil Aeronautics Administration, Ministry of Transportation and Communications

1. Supervise and ensure China Airlines reevaluating the planning and the execution of “Junior Capt/FO Proficiency Monitoring Program” to fulfill the program effectively to enhance the ability of manual landing operations to junior pilot.
2. Supervise and ensure the result of China Airlines requiring the pilot-in-command, if and when the flight collaborates with a junior pilot, must stay vigilant in approaching and landing operation, and taking over the control at proper timing or request a go-around as the relevant regulation requested once the aircraft encountering in suboptimal situation.