Executive Summary

On August 24, 2024, a DA-40NG aircraft, operated by Apex Flight Training Center, flight number AFA62, registered B-88003, was conducting an instrument cross-country training flight departing from Taitung Airport to Tainan Airport and Songshan Airport, then returning to Taitung Airport. During approach and landing at Tainan Airport, the aircraft performed a touch-and-go on an unauthorized runway. The aircraft subsequently continued the training flight to Songshan Airport and returned to Taitung Airport without any damage to the aircraft or injury to its occupants.

In accordance with the Transportation Occurrence Investigation Act of the Republic of China and with reference to Annex 13 to the Convention on International Civil Aviation, the Taiwan Transportation Safety Board (hereinafter referred to as TTSB) is the independent authority responsible for the investigation of this transportation occurrence. The invited parties in the investigation included the Civil Aeronautics Administration, Ministry of Transportation and Communications, and the Apex Flight Training Center. In accordance with established procedures, the draft investigation report of this occurrence was reviewed and revised during the 75th Board Meeting of the TTSB on May 9, 2025, and subsequently distributed to the relevant agencies and organizations for comments. The final investigation report was approved and released following deliberation at the 77th Board Meeting of the TTSB on July 11, 2025. Based on the factual information and analysis conducted during the investigation, a total of ten findings were identified.

Findings as the result of the investigation

<u>Findings Related to Probable Causes</u>

1. The occurrence flight crew adopted the VOR instrument approach procedure to Runway 36R at Tainan Airport, which is a non-precision approach with lower navigational accuracy. When the crew acquired visual contact with the runway and transitioned from instrument flight to visual flight for continued approach, the aircraft was not aligned with the designated landing runway 36R, but was instead closer to Runway 36L.

2. Due to a lack of operational experience in landing at airports with parallel runways, and insufficient risk alertness and situational awareness regarding potential runway misidentification, the flight crew visually identified the runway directly ahead, the Runway 36L, and subjectively assumed it was the assigned Runway 36R without proper verification.

3. During the approach and landing phase, the flight crew may have experienced channelized attention due to their focus on landing operations, which led them to overlook visual cues indicating that the runway markings did not correspond to Runway 36R. They also missed visual aids within their field of view indicating that the runway was closed. Consequently, they did not detect the runway misidentification in a timely manner and conducted a touch-and-go on Runway 36L, which was not assigned for landing and was closed for construction.

Findings Related to Risk

1. Prior to the occurrence, Apex's flight-related training, procedures, and standard callouts did not comprehensively cover the identification and verification of the runway before landing.

2. The Garmin G1000 Electronic Flight Instrument System, used by both

the Apex fleet and its flight simulator, contained a preset final approach course of 005 degrees in its database for the VHF Omni-directional Range (VOR) instrument approach to Runway 36R at Tainan Airport, instead of the charted course of 004 degrees in the approach procedure. If the course was manually adjusted to 004 degrees, switching the navigation mode from VOR to another mode would cause the course to revert to the preset 005 degrees from the database.

3. While using the VHF Omni-directional Range (VOR) approach mode, the occurrence flight crew did not verify whether the default course preset in the electronic flight instrument system database matched the charted approach course, nor did they manually set the course. This may have affected the accuracy and precision of the VOR navigation mode.

4. During the final approach phase, neither the Tainan Airport Tower controller nor the flight crew of the occurrence aircraft detected the runway misidentification in time. The aircraft landed on a runway under construction, posing a risk of collision with vehicles and obstacles present on the runway.

Other Findings

1. The occurrence flight crew held valid flight and medical certificates issued by the Civil Aeronautics Administration (CAA), and their flight qualifications met the requirements of both the CAA and the Apex Flight Training Center. The crew did not take any medication routinely, their rest and activities within 72 hours prior to the occurrence were normal, and the breath alcohol test conducted before departure from Taitung Airport indicated a result of zero.

2. The occurrence aircraft's weight and balance were within prescribed

limits. Review of maintenance records, deferred defect rectification logs, airworthiness directive (AD) lists, and control execution records for the 90 days prior to the occurrence revealed no abnormalities, nor were there any ADs relevant to this occurrence that were unexecuted.

3. During the closure of Runway 18R/36L at Tainan Airport for construction, the visual aids marking the restricted use area complied with the Civil Aerodrome Design and Operation Standard, except that closure markings spaced at intervals not exceeding 300 meters were not installed along the runway.

Transpiration Safety Recommendations

In the draft investigation report of this occurrence, the proposed safety recommendations to Apex Flight Training Center are as follows:

1. Enhance procedures, training, and assessments for flight crews to verify the landing runway during approach and landing phases, thereby increasing risk alertness and situational awareness to prevent runway misidentification incidents from recurring.

2. Urge flight crews to correctly use navigation equipment and verify that the default information in navigation instrument databases matches the charted data to ensure the accuracy and precision of navigation.

On April 6, 2025, Apex Flight Training Center submitted its implementation status regarding the safety recommendations outlined in the draft investigation report. Consequently, no further safety recommendations will be issued in this final investigation report.

In the draft investigation report of this occurrence, the proposed safety

recommendation to the Air Force Command Headquarters, Ministry of National Defense is as follows:

1. Enhance the vigilance and surveillance capability of the Tainan Airport Tower controller regarding aircraft conducting non-precision approaches. Controllers should actively and continuously monitor incoming aircraft through visual observation and surveillance equipment while ensuring runway clearance, and provide timely reminders to flight crews as necessary to prevent aircraft from landing on unassigned runways.

On June 6, 2025, the Air Force Command Headquarters, Ministry of National Defense submitted its implementation status regarding the safety recommendation in the draft report. Therefore, no further safety recommendations will be issued in this final investigation report.