

CIVIL AVIATION AUTHORITY OF VIETNAM



**FINAL REPORT¹
INVESTIGATION RESULT OF SERIOUS INCIDENT
LANDED ON RUNWAY UNDER CONSTRUCTION
ON 29/04/2018 AT CAM RANH INTERNATIONAL AIRPORT**

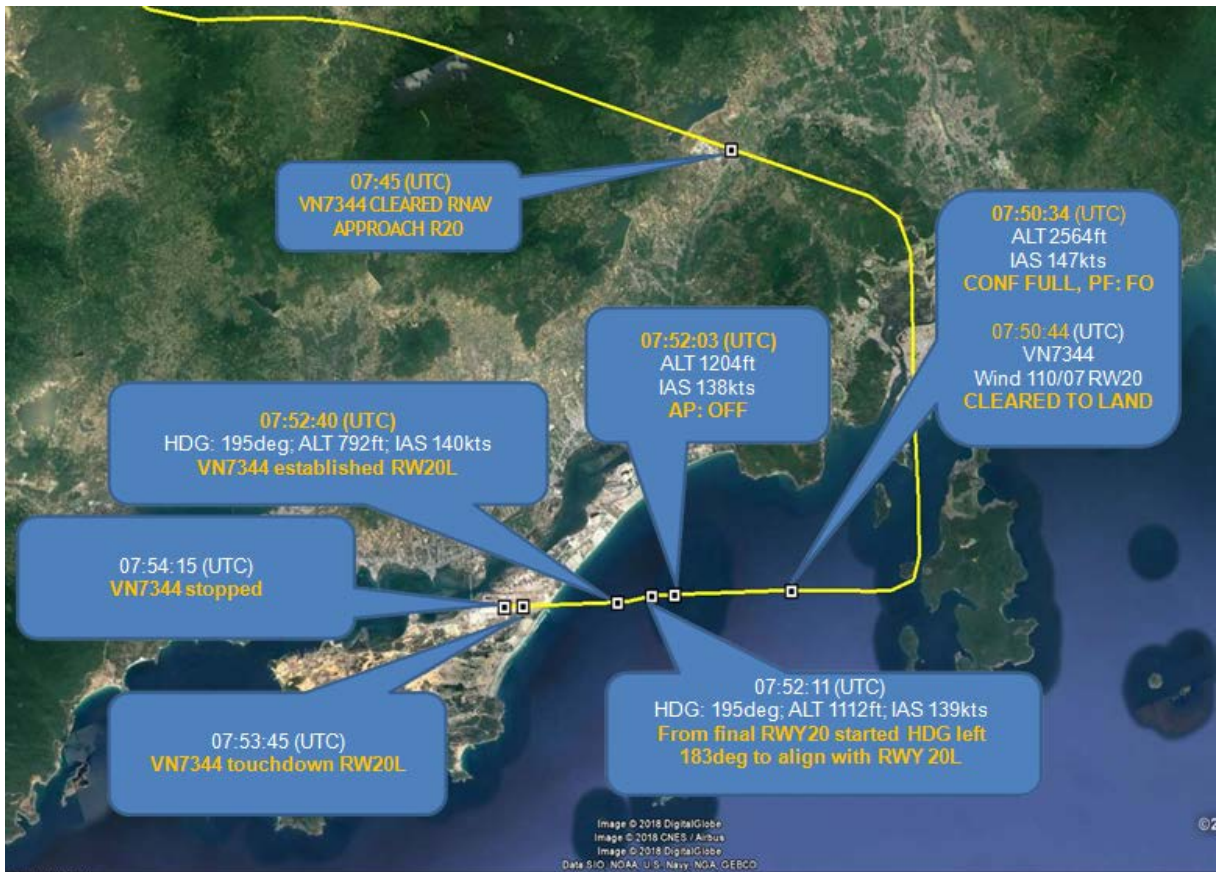
Hanoi, July 2018

¹ This report was implemented based on the sub Convention 13 of International Civil Aviation Organization and decree 75/2007/ND-CP in aircraft incident and accident investigation. The reported results are consulting from the State of Manufacture (France) based on the requirements of ICAO in serious incident.

1. Incident information

a) History of the flight

On April 29th 2018 14:53 (Local time), Vietnam Airlines flight crews operated A321 aircraft which was registered as VN-A613, made flight number VN 7344 route SGN-CXR. After implementing RNAV landing approach on runway RWY 20, in the Short Final at the altitude of 1204ft., the crew had turned off the auto-pilot and flight director functions, then performed the visual procedure and landed on the wrong runway, was under construction and had not put into operation at Cam Ranh International Airport.



The flight crew noticed that they landed on the wrong runway, then they implemented emergency stop on the aircraft right after the touch down process. The distance between the touch down and the RWY №2 runway heading (marked 20L) was about 500m. The distance between the touch down and the position where the aircraft was completely stopped was about 1000m. The distance between the stop position and the fence was about 450m.

Because of impediments which were rocks and building materials, the flight crew processed the emergency stop to prevent these obstacle courses. After the aircraft completely stopped on the runway RWY №2, the flight crew contacted the command tower and received a stop order. The flight crew turned off the main engine, then used auxiliary engine and waited for ground vehicle to take passengers to the airport terminal.

b) Flight crews information

➤ **Captain (PM):**

- Year of Birth: 1965
- Licenses, Certificates are valid
- Flight Time/On Type/VNA: 8.309h/ 3.060h/ 177h (Until 4/2018)
- Safety Record: NIL

➤ **First officer (PF):**

- Year of Birth: 1991
- Licenses, Certificates are valid
- Flight Time/On Type/VNA: 1.353h/ 1.081h (Until 4/2018)
- Safety Record: Level 3 GPWS Warning 08/3/2017.

➤ **Flight Crews Fatigue Management**

+ Before the flight on April 29th 2018, flight time and rest period management program of the flight crews was guaranteed based on CAAV regulation.

+ Before the flight VN7344, the flight crews had implemented SGN-HAN-SGN flights. This execution time had been qualified based on the regulation before the VN7344 was taken.

➤ **Training Program**

Qualified based on regulation before the flight was taken.

c) Aircraft Information

A321 aircraft registered as VN-A613, manufacturing number MSN 6748 has the certificate of airworthiness number 03-A/08/2015/GCN-CHK expired on 28/02/2019. Before the flight was taken, the aircraft had met requirements of airworthiness regulation to guarantee the safety of aircraft operation.

d) Meteorological Information

Weather was in good condition at Cam Ranh International Airport.

METAR VVCR 290600Z 10009KT 9999 FEW 015 33/25 Q1011

e) Communications

Communication and navigation devices were in good condition on the runway and at the airport.

f) Airport Information

Cam Ranh International Airport has a runway with two headings identified as 02 and 20. The standard methods which could be used included NDB (20), VOR/DME (20;02), RNAV GNSS Approach/RNP Arrival (20, 02), ILS (02).

Since 15/3/2015, the people's committee of Khanh Hoa province had organized a commencement ceremony to build the runway №2, which is paralleled and distance about 300m to the south of the current runway's center line at the Cam Ranh International Airport. The project was primarily invested by the construction management board of Khanh Hoa province. The CHC runway is currently under building condition. A part of this runway № 2 is published using for military purpose. The runway №2 has not been qualified for civil aviation purpose by any authorized facility.

At the time of the incident, the heading of the runway № 2 which is near the 02 heading of the operating runway was still under construction. There were some rubbish and construction materials on the other heading of the runway № 2, where the incident occurred near the 20 heading. The painted marks are clear on the runway № 2 painted with mark 20L in which the letter L is coincident to the center line of the runway; the touch down area and the center of the runway were clearly painted with marks.



(View: Aircraft approaching)



(View: Aircraft landing)

2. Investigation Deployment

After the incident occurred on 29/4/2018, Civil Aviation Authority of Vietnam organized an investigation team who attended at Cam Ranh International Airport on 30/4/2018. The jobs have been done at Cam Ranh airport including:

- i. Field and scene examination, evaluation of aircraft condition, runway condition and devices which guarantee the safety of flight operation
- ii. Collected data from the incident scene, reports of related individuals and organization, documentation of VN 7344 flight on 29/4/2018; the record between pilots and air traffic controller
- iii. Interviewed pilots, air traffic controller and related individuals
- iv. Stored digital flight data recorder (DFDR) and cockpit voice recorder (CVR) to decode for investigation

3. Damages

- a) Injuries to persons: no consequence
- b) Damage to aircraft:
 - i. The engine number 1's fan blades and intake area are damaged because of impediments which are gravels, rocks, iron pieces. The main part of the engine including compressor, combustion and turbine are under inspection and evaluation.
 - ii. LH is slightly damaged.

- iii. Vietnam Aviation Corporation is examining and evaluating aircraft damage (if any).



- c) Damage to infrastructure and devices of airport: no consequence.

4. Organizational and management information

a) Vietnam Airline

Vietnam Aviation Corporation is the flight crew management unit related to the incident. Vietnam Aviation Corporation is provided AOC certificate expired on 30/9/2018 by Civil Aviation Authority of Vietnam.

b) Cam Ranh International Airport and CHC Runway Safety team

Since 10/2010, ICAO has promulgated resolution about establishing and implementing runway safety program to enhance the safety operation and usage of the runway through particular solution, and decrease the number and serious level of deviated landing, invading, misusing runway and incident on the surface of the airport. Vietnam as a member of ICAO promulgated runway safety program and established runway safety team at every airport.

At Cam Ranh International Airport, the runway safety team was established based on documentary number 3318/TCTCHKVN-ANAT on 09/8/2017 with the constituent led by the leaders of Cam Ranh International Airport, the represented leader of port authority is vice team leader. The other units working on limited area, parking area, runway are members.

c) **Air Traffic Control Tower – Cam Ranh International Airport**

Cam Ranh International Airport's Air Traffic Control Tower which is belonged to South of Vietnam Air Traffic Management Corporation has responsibility to operate, grant clearance order, monitor arrival and departure of aircraft, approaching and landing in managed Cam Ranh area of the tower.

5. Analysis

- At 14:15:37, flight VN 7344 by the captain Andre Thomas Cuevas (Pilot Monitoring) and the first officer Tran Nhu Son 23 (Pilot Flying) took off at Tan Son Nhat airport under qualified weather condition, aircraft technique and planned to use ILS at RWY 02 based on CFP.

- At 14:40 (local time) before entering the transfer point between the HCM long road control and the Cam Ranh air traffic control, the flight crews contacted the control tower to request weather condition, landing information, then received the information of usage RWY 20 with RNAV method.

- At 14:45:10, the flight crews switched to communication frequency of CXR tower at the altitude of FL130, and received an allowance order to approach RWY 20 by RNAV.

- At 14:50:44, commander tower allowed the flight crews to land on RWY 20 heading. The flight crews used RNAV on the observed runway at the altitude of 1600ft, about 4 miles above sea level compare with the heading of the RWY 20. At this point, the aircraft was heading the RWY 20 direction.

- At 14:50:34, at the altitude of 1204ft, heading 196, the flight crews turned off the auto pilot and proceeded visual procedure. At this point, the flight crews observed the mark "20" highlighted on the heading of the runway № 2. Observing marks of the approaching area, the flight crews unified to identify the "20" heading which was the runway of Cam Ranh International airport and the beside runway (RWY 20 in fact) was identified as taxi way. At this point, the both captain and first officer determined to land on the runway with 20L mark. All activities of operation were meant to direct the aircraft to the left to benchmark with the RWY 20L.

- Analysis:

+ Before landing at Cam Ranh International airport, the flight crews had experience in flying and landing at 02 heading. However, this is the first time landing on the 20 heading by RNAV method.

+ In the flight history document, there is no NOTAM notification of the new runway and part of this runway is used for military purpose only. The flight crews might not know about the new runway which was under construction and had not put into operation.

+ The airport map VVCR 10-9 displays the incompletely building runway with a fuzzy line and shows that CXR airport has only one runway.

+ Actual observation of the RWY heading from cockpit position, the “20” mark of the runway № 2 is more clear than the mark of the RWY 20 which is currently in operation.

+ There is no warning sign of the no use runway when observing at the RWY 20L heading.

+ The flight crews also did not observe impediments on the 20L runway.

- From 14:51 to 14:53, the flight crews operated the aircraft from the position which was slightly straight to the RWY 20, then moved to the left to benchmark the RWY 20L. After benchmarking RWY 20L, the flight crews did not notice any signal from the light system indicating correct approach PAPI and landed without the support of PAPI.

- *Analysis:* the flight crews did not notice the uncommon signal when they observed PAPI light system which did not turn on (because the information system showed that the system normally worked) so they continued landing. There was no notification or warning of ATC when the aircraft approached the wrong CHC runway which had not put into operation.

- At 14:53, after the touch down on the 20L runway, the flight crews noticed that they landed on the runway which was under construction and there was impediments on the runway. The flight crews appropriately decided to stop the aircraft in emergency condition to prevent these obstacle courses.

6. Conclusion

a) Primary causes of the incident

- After turning off the AP and performing the visual procedure, the pilot observed the "20" sign prominently at the beginning of the new runway. The crew unified the new runway under construction is the assigned RWY and the lateral line (in fact, assigned RWY) is identified as a taxi way. At this point, both the captain and FO have determined they need to adjust the direction of the aircraft to the left to match the RWY 20L heading.

- Flight crew did not brief carefully about the airport Chart and did not observe the obstacles at the beginning of the RWY 20L, so they did not realize their mistake.

- After alignment with the RWY 20L, the crew did not notice any abnormalities when the PAPI signaling system was not illuminated (due to the pre-flight information system indicating that the system was functioning properly), so it was decided to land.

b) Objective factors

- The pilot does not have information about NOTAM A3468 / 17 on the flight envelope.

- Although new runway has shown no use (crossed out) on the airport map, however, the runway markings are already available on new runway and more visible than on the current runway, causing confusion for the flight crew.

- Observation activities from ATC have not been fully implemented to alert and support the pilot on time during approach at the threshold and touchdown.

7. Safety Recommendation

a) After the incident and the preliminary conclusion, CAAV promulgated a designation 119/CT-CHK on 02/5/2018 to ensure aviation safety.

b) Vietnam Airlines

- Require pilots to enhance preparations in advance in every flight to ensure having enough necessary information, carefully read the airport chart; in the flight, under allowed condition, contact the air traffic control tower as soon as possible to get weather's information, method and runway for landing to have enough time for preparation.

- Require pilots to enhance incorporations, cross-examine important information and runway information.

- Enhance training program to enhance cognitive capacity and situation awareness for pilots.

- Require pilots to enhance voluntary reporting in every situation and uncommon phenomenon, which can confuse pilots cause high risk incident.

- For related incident flight crews, conduct the training (situation awareness, cognitive capacity) before commencing the operational duty.

c) Airports Corporation of Vietnam & Cam Ranh International Airport

- Enhance monitoring to ensure security and safety of the project investor, construction unit of runway № 2.

- Immediately applying necessary solutions to inform and warn the aviation corporations who operate at Cam Ranh airport about unused runway.

- Inspect and guarantee the paint condition, airport markings based on standards, usually erase gums on the runway surface which is in operation at Cam Ranh international airport.

- Enhance the performance of the runway safety team in early identifying and implementing remedies prevent aviation high risk incident.

d) South of Vietnam Air Traffic Management Corporation and Cam Ranh Air Traffic Control Tower

- Enhance monitoring aircraft activities in the approach and landing process until the aircraft leaves the runway for on-time warning to prevent similar incident.

- Enhance effectively use of terminal monitoring devices ADS-B, add center line of the runway about 7-8NM on the monitor screen to detect on time, warn the flight crews when there is a large deviation.

- Immediately complete preparation to put the approach control position into operation in Cam Ranh Air Traffic Control Tower based on the plan that CAAV qualifies on 16/8/2018.

- Accelerate investment process to put ADS-B station for the Central and South of Vietnam, primary/secondary radar station into operation, especially at Cam Ranh international airport.

e) Investigation Team

Continue incorporating investigation organization of aircraft incident BEA – France (State of Manufacture) to quickly have official conclusions of incident investigation based on Chicago Convention which is used to implement treatment measure based on provision of law.