



Investigation report

C 23/1999 L

Translation of the Finnish original report

Incident at Vaasa airport, Finland, on 15 December 1999

LN-TDY, Embraer 110 Bandeirante

HW-334, Hawk Mk 51

According to Annex 13 of the Civil Aviation Convention, paragraph 3.1, the purpose of aircraft accident and incident investigation is the prevention of accidents. It is not the aim of aircraft accident investigation or the investigation report to apportion blame or to assign responsibility. This basic rule is also contained in the Investigation of Accidents Act, 3 May 1985 (373/85) and European Union Directive 94/56/EC. Use of the report for purposes other than the improvement of safety should be avoided.



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Other investigation material is stored at the Accident Investigation Board, Finland.



SYNOPSIS

A flight safety incident occurred at Vaasa airport on 15 December 1999 at 19.20 local time (17.20 UTC, Universal Co-ordinated Time), when an aircraft of type Embraer EMB-110 Bandeirante, owned by Reguljair Ltd, registered LN-TDY, call sign REF901, taxied to runway 34 at the same time when a Hawk advanced jet trainer operated by the Finnish Air Force, registered HW-334, call sign H30, was making a touch-and-go landing on runway 16. The Hawk passed the E110 at a height of about 50 meters after the touch-and-go landing. Neither pilot saw each other's aircraft because of darkness and occasional ground fog.

The air traffic controller on duty in Vaasa tower and the Hawk pilot reported the incident to CAA Finland, Flight Safety Authority, as required by Aviation Regulation GEN M1-4.

The Accident Investigation Board (AIB), Finland, decided to commence an investigation (C 23/1999 L) on 29 December 1999. Flight instructor Pekka Raine was appointed to investigate the incident. In addition, air traffic controller Ari Huhtala assisted in the examination of air traffic control operations.

The investigation report was sent for comments to the Air Navigation Services department of the Finnish Civil Aviation Administration, Finnish Air Force, and the Swedish accident investigation authority (Statens Haverikommission). The comments received have been taken into account in the report. The statement of the Air Navigation Services department is annexed. Statens Haverikommission also reported that Reguljair Ab had gone into liquidation and ceased operations.

The investigation was closed on 13 March 2001.



1 FACTUAL INFORMATION

1.1 Sequence of events

The Finnish Air Force Hawk, call sign H30, was approaching Vaasa airport on a night VFR navigation training flight. When the crew requested approach instructions for a touch-and-go landing, Vaasa TWR cleared it to join left downwind leg for runway 16. The radio communications were in Finnish. After a while the Reguljair EMB-110, call sign REF901, requested start-up, which the TWR accepted. The radio communications with REF901 were in English.

H30 reported on downwind leg for runway 16, and was cleared for a touch-and-go landing on runway 16. Vaasa TWR then cleared REF901 to holding Bravo, which the crew acknowledged. While REF901 was taxiing towards the holding position, the controller gave a route clearance and the crew read it back. However, REF901 did not stop at holding Bravo, but continued taxiing to runway 34. At the same time, H30 was making a touch-and-go landing on runway 16, coming towards REF901 at a distance of about 600 meters. H30 was then about to lift off after the touch-and-go landing, and became airborne again near taxiway Alfa.

While taxiing to the runway, REF901 crew asked the controller if they had been cleared to line-up. At that time, the controller realised what had happened and gave a negative answer. REF901 crew then reported that they would leave the runway, but the controller replied that it was no longer necessary. H30 had already passed REF901 at a height of about 50 meters. Thereafter the controller cleared REF901 to line up for runway 34.

Because of the darkness and patches of ground fog, neither pilot saw each other's aircraft. The controller saw both aircraft from the tower at the time of the incident, but did not notice that REF901 had taxied past the clearance limit.

A transcript of relevant radio communications on Vaasa TWR frequency 119,300 MHz is contained in Appendix 1.

1.2 Basic information

1.2.1 Aircraft

Twin-engined non-pressurised turboprop aeroplane Embraer EMB-110 Bandeirante, registered LN-TDY, used in commuter operations.

Two-seated advanced jet trainer Hawk Mk 51, registered HW-334.

1.2.2 Type of operation

REF901 was on a ferry flight from Vaasa to Umeå, Sweden.

H30 was conducting a night VFR navigation training flight from Kauhava to Vaasa and back to Kauhava.

1.2.3 Persons on board

REF901 had a crew of two pilots.

H30 had a flight instructor and a student pilot on board.

1.2.4 Injuries to persons

There were no injuries.

1.2.5 Damage to aircraft

Neither aircraft was damaged.

1.2.6 Other damage

There was no other damage.

1.2.7 Personnel information

Crew of REF901:

Pilot-in-command: airline transport pilot licence, total flying experience 4878 hours, of which 1835 hours on EMB-110.

Co-pilot: commercial pilot licence, total flying experience 665 hours, of which 443 hours on EMB-110.

The crew had been off duty on the previous day. On the day of the incident, their first shift had commenced at 5.10 UTC and ended at 6.50 UTC. During that time they had flown one flight of 30 minutes and made one landing. Thereafter the crew had rested until 11.20 UTC, when a new shift was started. During the second shift, the crew had been flying for two hours and made four landings before the incident now under investigation. The crew felt themselves well rested and fit for duty at the time of the incident.

Crew of H30:

Pilot-in-command: flight instructor, total flying experience 1450 hours, of which 750 hours on Hawk.

On the previous day, the flight instructor had worked during normal office hours. On the day of the incident his shift had commenced at 15.30 local time. The incident flight was the instructor's third flight on that day. The combined flight time of the two preceding flights was 1 h 41 min.



Student pilot: flying experience not relevant for the incident.

Air traffic controller:

The air traffic controller's licence was valid until 10 September 2001, ratings EFVA TWR/APP. The controller was on duty as scheduled and his alertness was normal.

1.2.8 Weather

EFVA 15.12.1999 at 1720 UTC: wind 270° 2 kt, visibility more than 10 km, surface fog, clouds FEW 900 ft, temperature -16°C, dewpoint -17°C, QNH1006.

There were occasional patches of ground fog. The air traffic controller was able to see both aircraft at the time of the incident. The pilot-in-command of H30 did not see the ground fog from the traffic circuit, but only during the touch-and-go landing.



2 ANALYSIS

2.1 Incident in Vaasa

H30 flew in accordance with the clearances issued. Because of the darkness and ground fog, the crew could not see REF901 taxiing towards the runway, and nothing in the radio communications alerted them either.

The crew of REF901 forgot their clearance limit and taxied to the runway without clearance. Due to darkness and ground fog, they could not see H30. The crew of REF901 could not understand the radio communications between the TWR and H30, which were in Finnish, and therefore did not realize that H30 was making a touch-and-go landing. If the REF901 pilots had understood this, they probably would not have taxied to an active runway.

When seen from the control tower, holding Bravo is situated at the front right side about 320 meters away. The controller did not notice REF901 taxiing past the clearance limit until the pilots asked him whether the plane had been cleared to the runway. For this reason, the controller could not prevent the incident.

Radio communications were in accordance with applicable regulations.

2.2 Incident in Oulu on 25 January 2000

An incident similar to that in Vaasa occurred in Oulu on 25 March 2000. In that case, an Estonian Let 410 aircraft operated by EV Piirivalve Lennusalk, registered ES-PLY, took off without clearance when there was an airport maintenance vehicle on the runway. The aircraft passed the vehicle from a height of about 20 - 30 meters during the initial climb. The incident has been investigated by the Finnish AIB, and the following is an extract from investigation report No. C 2/2000 L (originally written in Finnish).

There are means to prevent such situations. The controller on duty at the time of the incident suggested that the pilots could be informed of the expected delay and its cause. In the incident now under investigation, the controller said: "ES-PLY line up runway 30". However, in his incident report, which was very comprehensive and useful for the investigation, he stated that a better clearance would have been: "ES-PLY line up runway 30 and wait, will be 1 min delay before takeoff due to vehicle on runway".

2.3 Means for the ATC to prevent this kind of incidents

The common factor for the incidents described above was that the pilots of the aircraft not complying with the clearance were not aware of the other essential traffic. In Vaasa, the pilots could not understand the radio communications between the Finnish Air Force



Hawk and the controller, since they were conducted in Finnish. In Oulu, the airport maintenance vehicle was on a different frequency.

In the investigator's opinion, the procedure suggested by the controller in the Oulu incident could have been used to prevent the Vaasa incident as well: the controller could have informed the Reguljair Bandeirante crew of the reason for the delay. It must, however, be emphasised that the current regulations on ATC operations do not require such information to be provided.

The above solution, providing information on essential traffic, also has its drawbacks. It increases radio traffic on the frequency and adds to the controller's workload. Moreover, it is only suitable for quiet traffic situations. It is obvious that this kind of "justification" of clearances would not be possible at times of high traffic density.



3 Conclusions

3.1 Findings

1. The pilots and the controller were properly licensed and qualified for their duties.
2. The crew of REF901 forgot their taxi clearance and taxied to the runway without clearance, at the same time when H30 was making a touch-and-go landing for which it had been cleared.
3. The crew of REF901 could not understand the radio communications between the controller and H30, which were in Finnish, and therefore did not realize that H30 was making a touch-and-go landing.
4. Because of darkness and ground fog, the crews of REF901 and H30 could not see each other.
5. H30 made the touch-and-go landing, for which it had been cleared, without knowing that another aircraft had taxied to the runway.
6. The air traffic controller noticed the traffic conflict, but too late to intervene in the situation.
7. H30 passed REF901 after the touch-and-go landing at a height of about 50 meters.

3.2 Probable cause

The incident occurred because the crew of REF901 forgot their taxi clearance and taxied to an active runway without clearance. The actual reason why they forgot the clearance could not be determined.

Contributing factors were the use of the Finnish language in radio communications besides English, and the prevailing conditions.



4 RECOMMENDATIONS

No recommendations are issued.

Helsinki, 13 March 2001

Pekka Raine

Appendices

1. Radio communications on Vaasa TWR frequency 119,300 MHz

Reference material

The following investigation material is stored at AIB, Finland:

1. Decision of the Accident Investigation Board n:o C 23/1999 L
2. Reports filed by REF901 pilots to the airline company
3. GEN M1-4 report filed by the Hawk instructor
4. GEN M1-4 report filed by the air traffic controller on duty
5. Records of the Hawk instructor's telephone interview
6. Preliminary analysis of the incident by Vaasa airport
7. Correspondence between the investigator and Reguljair Ltd.
8. Correspondence with the Swedish accident investigation authority.

Radio communications relating to the incident of 15 December 1999 at Vaasa

(Translator's note: The conversations written in italics were originally in Finnish, and have been translated into English for the purpose of this report. The word "Heikki" is a name used in the Finnish phonetic alphabet, corresponding to "Hotel" in the international one.)

H30:	<i>Heikki 30, downwind 16.</i>
EFVA TWR:	<i>Heikki 30, cleared for touch-and-go, runway 16, wind calm, after touch-and-go leave control zone via Laihia VFR.</i>
H30:	<i>Cleared for touch-and-go runway 16 and after touch-and-go will leave control zone via Laihia VFR, Heikki 30.</i>
H30:	<i>Heikki 30, gear pressure.</i>
EFVA TWR:	<i>...Heikki 30...</i>
EFVA TWR:	Reguljair 901, taxi to holding Bravo.
REF901:	Taxiing to holding Bravo, Reguljair 901.
EFVA TWR:	Reguljair 901, clearance is available.
REF901:	Go ahead, 901.
EFVA TWR:	Reguljair 901, cleared Umeå direct flight level 60, squawk 3650.
REF901:	Cleared to Umeå, flight level 60, squawking 3650, Reguljair 901.
EFVA TWR:	Vaasa.
REF901:	...901 cleared to line-up.
EFVA TWR:	Negative.
REF901:	I will leave runway, 901.
EFVA TWR:	Don't need anymore.
EFVA TWR:	Reguljair 901, it was to holding Bravo.
REF901:	Roger, 901.
EFVA TWR:	There was just one military Hawk making touch-and-go.
REF901:	Okay.
EFVA TWR:	And 901, you are now cleared line-up runway 34.

REF901: Lining up 34, 901.

EFVA TWR: Vaasa.

H30: *Heikki 30, do you agree, at 350 meters on QFE 1007.*

EFVA TWR: *Heikki 30, affirm at 350 meters in Vaasa TMA on QNH 1007.*

H30: *Affirm at 350 meters in Vaasa TMA, Heikki 30.*

EFVA TWR: *Heikki 30, you probably noticed that Reguljair coming to the runway from Bravo when you were making touch-and-go.*

H30: *Please repeat, Heikki 30.*

EFVA TWR: *And Heikki 30, did you notice that there was that Reguljair 901 coming to the runway from Bravo when you were making touch-and-go.*

H30: *No, I did not notice.*

EFVA TWR: *Heikki 30, roger, anyway it almost got to the runway when you were just going around.*

H30: *Roger.*

EFVA TWR: Reguljair 901, cleared for takeoff runway 34, left turn, wind is calm.

REF901: Left turn, cleared for takeoff, Reguljair 901.

EFVA TWR: Vaasa.