



Investigation report

C9/2007L

An unauthorized approach to an engaged runway at Pori aerodrome on 7 November 2007

TC-AAP

BOEING 737-800

LENTO11

Aerodrome maintenance vehicle

According to Annex 13 to the Convention on International Civil Aviation, paragraph 3.1, the purpose of aircraft accident and incident investigation is the prevention of accidents. It is not the purpose 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 reasons other than improvement of safety should be avoided.



SUMMARY

An incident occurred on 7 November 2007 at 20:23 UTC (Finnish time -2h) at Pori aerodrome, involving a Pegasus Airlines Boeing 737 charter flight from Copenhagen and an aerodrome maintenance vehicle. Accident Investigation Board Finland (AIB) appointed investigation commission C9/2007L for this incident. Investigator Markus Bergman was named Investigator-in-Charge with Investigator Erkki Kantola and Air Accident Investigator Tii-Maria Siitonen as members of the commission.

As the aircraft was approaching Pori, a maintenance vehicle was assessing the Runway Visual Range (RVR) by counting the number of visible runway lights on the active runway. The air traffic controller reported the RVR to the pilots. Because the RVR was below the landing minimum he cleared them to a holding pattern to wait for the RVR to improve. However, the pilots were of the impression that they were permitted to continue the approach to the Decision Altitude (DA) of the ILS approach. The misunderstanding between the air traffic controller and the pilots resulted in a collision hazard between the vehicle and the aircraft.

The incident occurred because the pilots flew the approach without the required ATC clearance. Unsatisfactory and unclear radiocommunications between the air traffic controller and the flight crew were contributing factors. Another contributing factor was that the pilots violated regulations by continuing with the approach even when the reported RVR was below minima.

The investigation commission did not make any recommendations because present rules and regulations, if properly observed, suffice in preventing these kinds of incidents from taking place.



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ABBREVIATIONS

ACC	Area Control Centre
AFIS	Aerodrome Flight Information Service
AGL	Above Ground Level
ATIS	Automatic Terminal Information Service
CAT I	Category I
DA	Decision Altitude
DFDR	Digital Flight Data Recorder
ESARR	Eurocontrol Safety Regulatory Requirement
hPa	Hectopascal
IAF	Initial Approach Fix
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
JAR-OPS 1	Joint Aviation Requirements, Commercial Air Transportation (Aeroplanes)
METAR	Aviation Routine Weather Report
MHA	Minimum Holding Altitude
MHz	Megahertz
MSA	Minimum Sector Altitude
OM	Outer Marker
OVC	Overcast
QNH	Altimeter sub-scale setting
Rate	Remote airport terminal equipment
ROP	Runway Observation Position
RVR	Runway Visual Range
SSR	Secondary Surveillance Radar
TMA	Terminal Control Area
TWR	Tower
UTC	Co-ordinated Universal Time
VOR/DME	VHF omnidirectional radio range / distance measuring equipment



SYNOPSIS

An incident occurred on 7 Nov 2007 at 20:23, involving a Pegasus Airlines charter flight PGT442 from Copenhagen to Pori. The aircraft was a Boeing 737-800 airliner, registration TC-AAP.

The pilots flew an instrument approach for a runway on which a maintenance vehicle was simultaneously assessing the RVR, resulting in a collision hazard between the aircraft and the vehicle. However, the incident did not cause injuries to persons or any damage.

The air traffic controller reported a serious incident to the Area Control Centre (ACC) after PGT442 had departed Pori. AIB Finland was notified of a serious incident approximately 1.5 hours after the occurrence. The air traffic controller and the driver of the maintenance vehicle reported the incident on 8 Nov 2007 in accordance with the national GEN M1-4 flight safety reporting procedure. The Finnish Civil Aviation Authority (CAA Finland) received the captain's account, dated 11 Nov 2007, from Turkey's Civil Aviation Authority on 3 Jan 2008.

After an initial evaluation, Accident Investigation Board Finland appointed investigation commission C9/2007L for this incident. Investigator Markus Bergman was named Investigator-in-Charge with Investigator Erkki Kantola and Air Accident Investigator Tii-Maria Siitonen as members of the commission. Dr. Päivikki Eskelinen-Rönkä assisted the commission as an expert in analysing the recorded audio material. Pursuant to ICAO Annex 13, AIB Finland sent a Notification of an Incident to the Turkish CAA on 12 Nov 2007.

All times in this report are in UTC. The investigation report was translated into English. The material used in the investigation is stored at the Accident Investigation Board Finland.

The investigation was completed on 24.7.2008.



1 FACTUAL INFORMATION

1.1 History of the flight

Pegasus Airlines flight PGT442 was on its way from Copenhagen, Denmark to Pori aerodrome, Finland. The aircraft was a Boeing 737-800 airliner, registration TC-AAP. There were eight crew members and 53 passengers onboard.

As PGT442 was approaching Pori, the weather was foggy and the Runway Visual Range (RVR) had decreased to 500 m before the aircraft entered Pori terminal area (TMA). The minimum required RVR for an ILS CAT I precision approach and landing to RWY 30 was 550 m.

The air traffic controller cleared PGT442 via arrival route TUSKU 2 B to the initial approach fix (IAF) PITUM. He also cleared PGT442 to descend to 1700 ft, which was the minimum holding altitude (MHA) on PITUM, the intermediate approach altitude for an ILS Z RWY 30 approach as well as the minimum sector altitude (MSA) north of Pori VOR/DME PREVIK radials 090/270. There was no other traffic in Pori TMA at the time of the occurrence.

Whereas the air traffic controller assumed that PGT442 would enter PITUM holding, the pilots presumed that the air traffic controller was aware of the fact that they were going to fly a straight-in approach to RWY 30 after having completed the standard arrival. The misunderstanding involving the last ATC clearance was caused by unclear and unsatisfactory radiotelephony. Neither the recorded radiocommunication nor the captain's account clearly establish what the flight crew intended to do after reaching the ILS approach decision altitude (DA).

After completing the standard arrival route TUSKU 2 B the aircraft directly established on the RWY 30 ILS localizer. Instead of entering the holding pattern, PGT442 left the intermediate approach altitude 1700 ft, descended on the ILS and crossed the outer marker (OM), continuing towards the procedure-specific DA.

It is not permissible to continue with an instrument approach past the outer marker or equivalent position if the reported RVR is below the landing minimum:

ICAO Annex 6, 4.4.1.2: "An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (1 000 ft) above the aerodrome in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum."

JAR-OPS 1.405: "Commencement and continuation of approach (a) The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported RVR/Visibility but the approach shall not be continued beyond the outer marker, or equivalent position, if the reported RVR/visibility is less than the applicable minima."

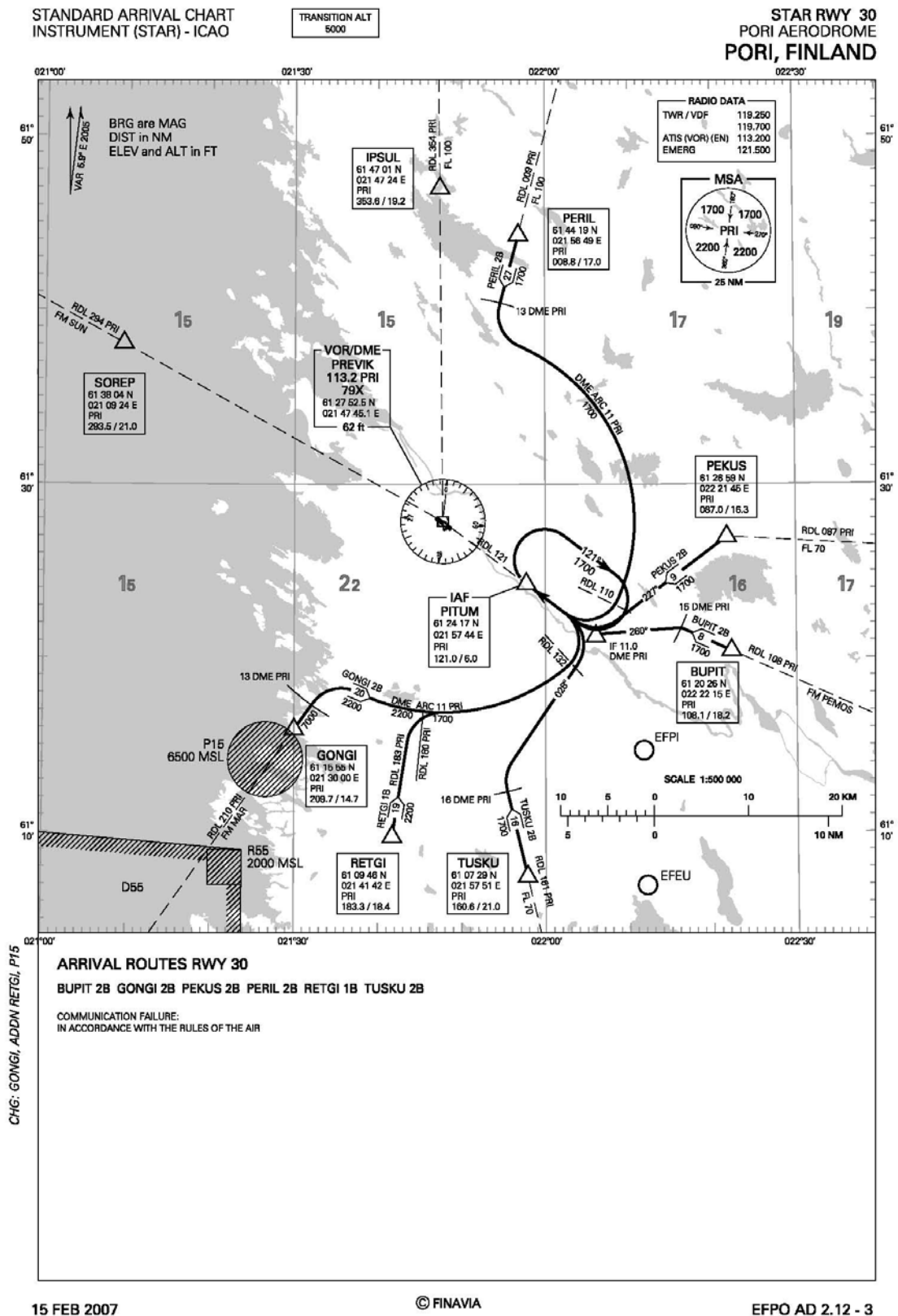


Figure 1. Standard arrival routes, RWY 30, © Finavia, Permission 4/590/2007



Pori aerodrome does not have automatic RVR measuring equipment. Therefore, a maintenance vehicle was near the touchdown area of RWY 30, with its driver counting the visible runway lights. The air traffic controller converted this number into Runway Visual Range. The RVR assessment was performed in accordance with valid regulations. The regulations are based on procedures pursuant to ICAO Annex 3 and ICAO Doc 9328 "Manual of Runway Visual Range Observing and Reporting Practices".

Only when the aircraft was close to the DA did the air traffic controller realize that PGT442 was flying an instrument approach instead of joining the holding pattern on PI-TUM. He ordered the vehicle off the runway but it had not managed to completely vacate the runway before PGT442 passed it. According to their account, the flight crew of PGT442 initiated a missed approach procedure when they reached the ILS decision altitude. The approach and go-around were flown on autopilot.

The driver of the maintenance vehicle estimated that the wing tip of the aircraft cleared his vehicle by approximately 15 m. According to the captain's account, the flight crew did not see the vehicle on the runway. Due to the poor visibility, the air traffic controller did not catch sight of the aircraft during the approach or go-around. On the basis of digital flight data recorder (DFDR) information, the aircraft did not descend below 215 ft MSL. The DA is 213 ft. According to the flight data recorder, the minimum radio altimeter reading was 185 ft AGL (approx. 56 m).

After the missed approach PGT442 flew another approach and landed on RWY 30 at 20:33. After the landing the air traffic controller informed the pilots of the vehicle which had been on the runway and said he had been under the impression that the aircraft was going to remain in the holding pattern at 1700 ft.

When the aircraft was about to depart Pori, approximately half an hour after landing, the air traffic controller told the flight crew that he was going to file an incident report. The pilots replied that they had flown the approach and the subsequent go-around in accordance with standard procedures.

The air traffic controller and the driver of the maintenance vehicle filed written flight safety incident reports with the proper authorities. After PGT442 had departed Pori, the air traffic controller reported the occurrence as a serious incident to the ACC which, in turn, relayed this information to AIB and CAA Finland. The national regulation GEN M1-4 requires air traffic controllers or AFIS officers to report aviation accidents or serious incidents instantly to their respective ACC. AIB Finland was notified of a serious incident at 21:58, i.e. 1 hour 35 minutes after the occurrence. CAA Finland received the captain's account on 3 Jan 2008 from Turkey's Civil Aviation Authority.

On 30 Jan 2008 AIB requested material related to the investigation from the operator and from Turkey's CAA. The Turkish authorities promptly delivered the requested material. Only after repeated requests did the operator provide most of the information, between 11 Apr 2008 and 24 Jun 2008. The investigation was hampered by the delays in receiving the information.

1.2 Injuries to persons

There were no injuries to persons.

1.3 Damage to aircraft

There was no damage to aircraft.

1.4 Other damage

There was no other damage.

1.5 Personnel information

Air traffic controller: Age 33

Licence: Air traffic controller, valid until 18 Oct 2009

Medical certificate Valid until 10 Sept 2009

Ratings: All required ratings were valid

The air traffic controller received his ATC licence in 1999. He has worked as air traffic controller in Pori since 2000.

Captain: Age 42

Licences: JAR Air Transport Pilot's Licence, valid until 24 Nov 2008

Medical certificate: JAR class 1, valid until 6 Jan 2008

Ratings: All required ratings were valid

The captain was rated as a B737 type rating instructor and authorized as a type rating examiner. He was also Pegasus Airlines' deputy chief of training.

Flying experience	Last 24 hours	Last 30 days	Last 90 days	Total hours
All types				Approx. 8250 h
Type in question	N/A	Approx. 57 h	Approx. 207 h	Approx. 6925 h

Co-pilot: Age 36

Licences: JAR Commercial Pilot's Licence, valid until 19 Apr 2008

Medical certificate: JAR class 1, valid until 26 Dec 2007

Ratings: All required ratings were valid



The co-pilot received his B737 type rating on 2 May 2007 and began working for the airline on 8 Mar 2007.

Flying experience	Last 24 hours	Last 30 days	Last 90 days	Total hours
All types				Approx. 3300 h
Type in question	Approx. 5 h	Approx. 80 h	Approx. 251 h	Approx. 492 h

Pilot in-command:

The flight crew comprised three pilots. The pilot in-command was not scheduled to fly, nor was he on the flight deck at the time of the incident.

1.6 Aircraft information

The aircraft was a 177/189 seat Boeing 737-800 twin-turboprop airliner, registered in Turkey (TC-AAP), owned by Gecas France Sarl and operated by Pegasus Airlines.

The aircraft's certificate of airworthiness was valid until 17 Feb 2008.

1.7 Meteorological information

Weather at Pori aerodrome was foggy at the time of the occurrence. Night instrument meteorological conditions (IMC) prevailed.

METAR at 19:50: Wind 90 degrees four knots, visibility 300 metres, RWY 30 RVR 650 m, fog, overcast (OVC), cloud base 100 ft, temperature zero degrees Celsius, dewpoint zero degrees Celsius, QNH 996 hPa.

METAR at 20:20: Wind 80 deg 2 kt, visibility 200 m, RWY 30 RVR 500 m, fog, vertical visibility (VV) 200 ft, temp 0° C, dewpoint 0° C, QNH 996 hPa.

METAR at 20:50: Wind 80 deg 2 kt, visibility 200 m, RWY 30 RVR 650 m, fog, VV 200 ft, temp 0° C, dewpoint 0° C, QNH 996 hPa.

1.8 Aids to navigation and radars

Aids to navigation played no role in the incident.

The air traffic controller used a Rate radar monitor which displays secondary surveillance radar (SSR) information. Whereas it is permitted to use SSR information in ATC clearance planning, clearances shall only be issued on the basis of procedural separation (non-radar separation). The Rate display can also be used to monitor flights, taking into account the radar blind area caused by the positioning of the SSR antennas. The

Rate altitude display is based on the standard atmospheric setting 1013.2 hPa, instead of the local QNH. At the time of the incident the Rate radar blind altitude at Pori was approximately 1600 ft, which translated to approximately 1150 ft on the local QNH 996 hPa.

1.9 Communications

Radiocommunications between the aircraft and the air traffic controller were conducted on Pori tower (TWR) frequency 119.250 MHz. Ground radio communications were conducted on 445.45 MHz. All of the frequencies used operated normally.

Radiotelephony between the air traffic controller and the pilots was unsatisfactory and conducted, to some extent, in violation to ICAO regulations.

1.10 Aerodrome information

Pori airport is a state-owned international aerodrome. It is located at 61°27'41"N, 021°47'52"E. Aerodrome elevation is 44 ft (13 m). There are two runways: RWY 12/30 and RWY 17/35.

The incident occurred on RWY 30 which is 2351 m long and 60 m wide. RWY 30 has CAT I ILS precision approach equipment and high-intensity approach and runway lights.

The Pori airport does not have an automatic RVR measuring system. RVR for runway 12/30 is measured by assessing it visually. Pending permission from the air traffic controller, specially trained airport maintenance staff assess the RVR from the Runway Observation Position (ROP). On RWY 30 the ROP is on the runway centreline, 60 m from threshold (figure 2). The observer counts the number of high-intensity runway lights he can see from the ROP. The air traffic controller then converts this information into RVR.

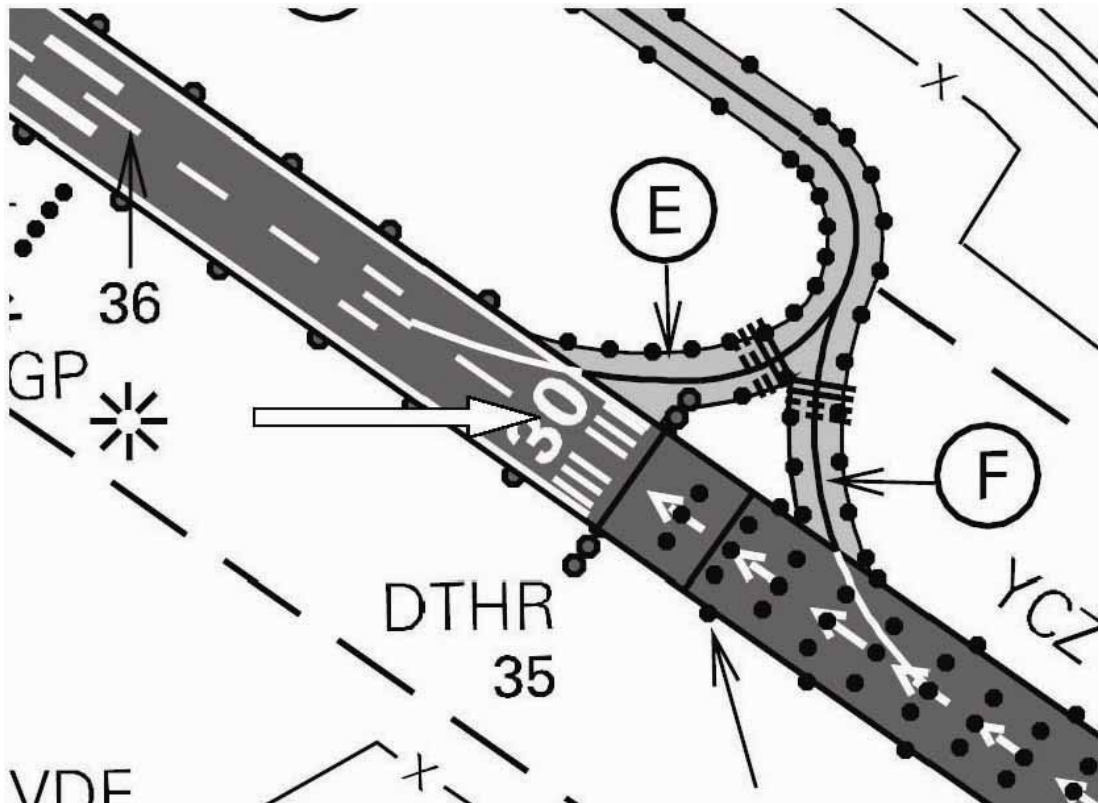


Figure 2. The Runway Observation Position, © Finavia, Permission 4/590/2007

1.11 Flight recorders

The aircraft had a Digital Flight Data Recorder. The investigation used data downloaded by the operator.

Cockpit Voice Recorder data was not available for the investigation.

1.12 Wreckage and impact information

Not required.

1.13 Medical and toxicological information

No medical or toxicological tests were performed.

1.14 Fire

There was no fire.

1.15 Rescue operations and survival aspects

Not required.

1.16 Test and research

Dr. Päivikki Eskelinen-Rönkä, an audio analysis expert, assisted the investigators in analysing the recorded radiocommunications.

1.17 Organizations and management

Organizations and management were not investigated.

1.18 Other information

Pegasus Airlines is a Turkish airline which operates under JAR-OPS-1 regulations. The airline, established in 1990, flies scheduled domestic and international routes as well as chartered flights with passenger jets.

On 12 Nov 2007, pursuant to ICAO Annex 13, AIB Finland dispatched a Notification of an Incident to the Turkish CAA.



2 ANALYSIS

2.1 The events

At 20:07:20 PGT442 contacted Pori TWR and reported that they had listened to ATIS information A and requested the ATC to confirm that visibility was 300 m. The pilots used the phrase “runway visibility”, which the air traffic controller inferred as RVR (Runway Visual Range). According to ATIS A, visibility was 300 m at 19:50, but the measured RVR was 650 m. The air traffic controller reported the RVR to PGT442 and said the next RVR value would be available within approximately five minutes. The air traffic controller, too, used the phrase “runway visibility” when he referred to the RVR. The aircraft acknowledged this information. According to the pilots’ post-flight report and the captain’s account the flight crew was under the impression that visibility was 1650 metres.

At 20:12:03 PGT442 reported that they were on standard arrival route TUSKU 2B and approaching FL 100. The air traffic controller issued the inbound clearance: *“Sunturk 442 cleared to PITUM via TUSKU 2B. When ready descend to 1700 feet, QNH 996 and ILS Zulu approach runway 30 no delay expected”*.

PGT442 requested the ATC to confirm that they were cleared to 1700 ft, which the air traffic controller did. He also repeated the QNH.

PGT442 read back the clearance: *“On the QNH 996 now descending to 1700 via TUSKU 2B, 442.”* The aircraft did not read back the clearance limit PITUM, the runway in use or the estimated time of approach. Likewise, the air traffic controller did not request the pilots to read these items back.

In his report the captain stated that the flight crew got the impression that the inbound clearance also cleared them for the ILS approach: *“Sunturk 442 cleared to PITUM ...and ILS Zulu approach...”* According to ICAO radiotelephony procedures the air traffic controller should have used the phrase *“...expect ILS Zulu approach...”* so as to differentiate the inbound clearance from an approach clearance.

At 20:12:40 the air traffic controller reported that the latest, taken one minute earlier, RVR was 500 metres. *“And latest RVR values for runway 30 measured just a minute ago was five hundred meters.”* The aircraft acknowledged: *“Roger, 442. We’ll continue till minimum”*.

The air traffic controller said that he took this as reference to the minimum holding altitude on PITUM (1700 ft). However, as per the captain’s report, the flight crew meant the ILS landing minimum, i.e. the decision altitude.

At 20:12:53 the air traffic controller requested PGT442 to confirm that their minimum landing RVR was 550 m. The aircraft acknowledged this, from which the controller inferred that PGT442 could not fly an approach before the RVR improved to at least 550 m.

At 20:13:01 the air traffic controller informed the aircraft that RVR assessment was continuing and that he would report any improvement without delay. He then requested the aircraft to report TUSKU next. The aircraft replied: "*Call you TUSKU, 442*". However, PGT442 never reported crossing TUSKU.

At 20:18:20 the air traffic controller told PGT442 that the RVR for RWY 30 was still 500 m and that he would immediately inform them of any improvement in the RVR.

PGT442's acknowledgement was blurred and even closer audio analysis could not produce a satisfactory interpretation: "*Sunturk442, we'll continue until minimums if we ...er...then not see approach lights full ... uh... runway may/may(be) we/ we'll / we will execute approach.*" With this acknowledgement PGT442 tries to explain that they will continue with the approach until the landing minimum. The last part of the message does not precisely describe what they intended to do after having reached the minimum. The captain explained in his account that their intention was to request permission to fly the approach until the landing minimum despite the too low RVR.

The air traffic controller's reply "*Roger, report next PITUM outbound*" may have reinforced the flight crew's impression that they were also cleared for an ILS approach, even though the term "outbound" refers to joining a holding pattern or racetrack procedure. Because of PGT442's unclear acknowledgement the air traffic controller tried to confirm his earlier clearance by requesting the aircraft to report entering the holding pattern on PITUM.

At 20:18:45 PGT442 called: "*Uh...we...er..approaching now ...er...intercept point, 442*". It is not known for certain what the flight crew meant by "intercept point". However, the air traffic controller acknowledged this by saying "*Sunturk 442*".

At 20:20:36 PGT442 reported being established on the final approach: "*And we are on ...er...final establishing*". The air traffic controller acknowledged this and requested PGT442 to report entering PITUM holding: "*Sunturk 442, roger that and report when entering PITUM holding.*" PGT442 replied: "*Call you, 442*". This reinforced the air traffic controller's belief that PGT442 was about to enter the holding pattern on PITUM.

The captain stated in his written report that the air traffic controller did not clear them into a holding pattern. In his later statement, after having received information from radiotelephony transcripts, he said that he never heard the air traffic controller's clearance to hold on PITUM and that he had misinterpreted his orders to report PITUM outbound. It is the view of the investigation commission that the air traffic controller's requests, twice repeated, for PGT442 to report PITUM outbound and to report entering PITUM holding were unequivocal.

At 20:22:32 PGT442 reported: "*Sunturk 442 established ILS runway 30*". This phrase means that the aircraft was following the localizer and glide path of the ILS approach for RWY 30. From this information the air traffic controller could have reasoned that PGT442 was descending below 1700 ft, its clearance altitude. Nevertheless, the air traffic controller still thought that PGT442 was about to enter PITUM holding pattern and,



therefore, he again requested PGT442 to report PITUM outbound: “*Sunturk 442 and report when passing Pitum outbound.*”

As PGT442 was acknowledging this at 20:23:45, by saying “*When passing PITUM outbound, Sunturk442*”, the other pilot reported that 442 was approaching the landing minimum: “*We are approaching minimums 442*”.

This call and the fact that PGT442 was no longer visible on the Rate monitor made the air traffic controller suspect that the aircraft was not about to enter the holding pattern, after all. He wanted to verify this and requested the aircraft to confirm that they were not in the middle of an approach: “*Uh...confirm that you are not making an approach now, it's not... er...RVR values are not enough for you*”.

Had the air traffic controller taken the difference between the local QNH and standard pressure on the Rate display into consideration, he might have noticed earlier that PGT442 had descended below the altitude for which it was cleared.

The air traffic controller knew that in order to continue with the approach beyond the outer marker or equivalent position, the required RVR was 550 m at minimum. He assumed that the pilots would comply with the ATC clearance and regulations, and that they would keep holding until RVR had improved. The continuance of the approach was so unexpected that - even though the pilots attempted to explain their intention to continue with the approach until the DA - the air traffic controller did not grasp it.

PGT442's reply was so unclear that even with audio analysis it could not be satisfactorily understood: “*Okay then ... uh ...we start and we will ... er...missed approach at minimums*”. In accordance with the captain's report, the pilots continued with the approach to the decision altitude before they initiated a missed approach.

When the air traffic controller had verified that PGT442 was actually making an approach, he decided to order the maintenance vehicle to get out of the way of the approaching aircraft before replying to the aircraft: “*Lento11, vacate the runway immediately*”. The air traffic controller did not order the aircraft to go around. In his statement he said that he thought that by the time he would have ordered a go-around and the flight crew had read it back, the aircraft might almost have reached the touchdown zone with the vehicle still on the runway.

Even though the RVR observer sped off of the Runway Observation Position (ROP), his vehicle was still partially inside the runway edge when PGT442 passed overhead. As per his account, the driver spotted PGT442 in his rearview mirror as it flew over the ROP. He estimated that the wing tip of the aircraft cleared his vehicle by approximately 15 m. The driver's statement and the DFDR-based estimation of the distance between the vehicle and the aircraft at the moment when they passed each other are conflicting.

It is not certain whether the pilots of PGT442 were prepared to land, conditions permitting, or whether they would have initiated a missed approach at the DA in any case. Pursuant to the captain's report, the pilots had told the ATC that they would continue with the approach until the DA and, barring sufficient visual reference to the ground, ini-

tiate a missed approach. In his report the captain cites the *visibility* (500 m) and a missed landing clearance as reasons for initiating the missed approach.

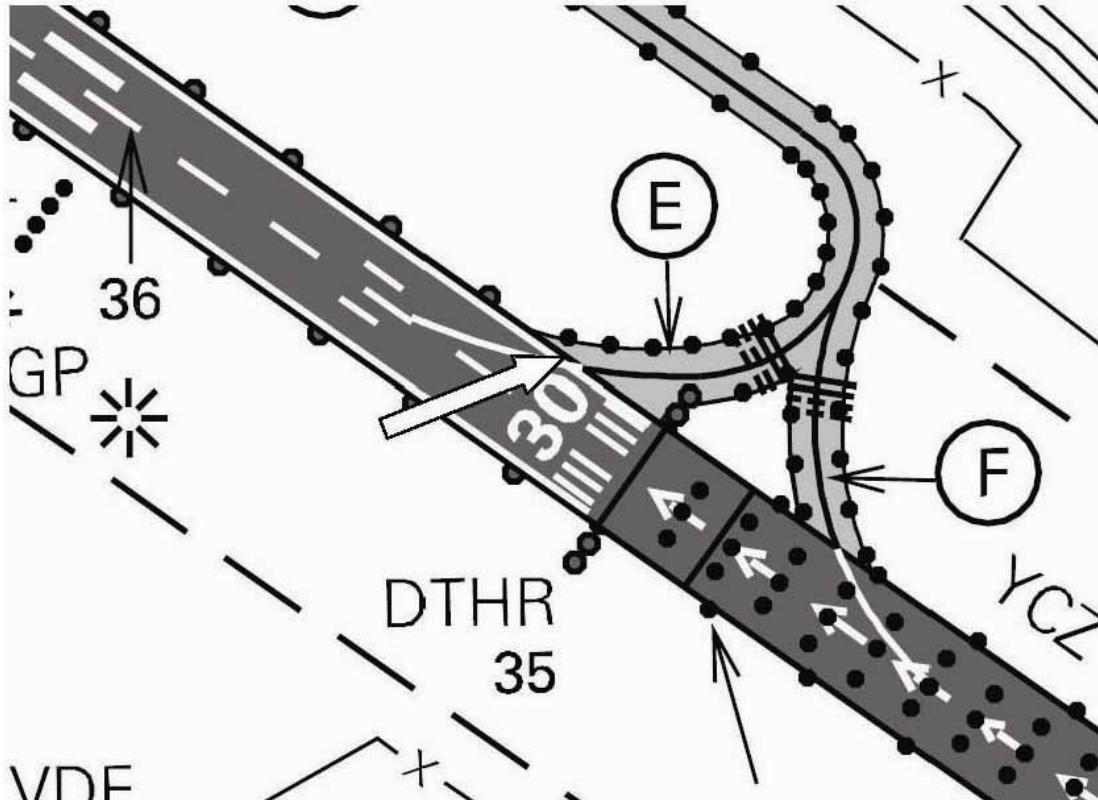
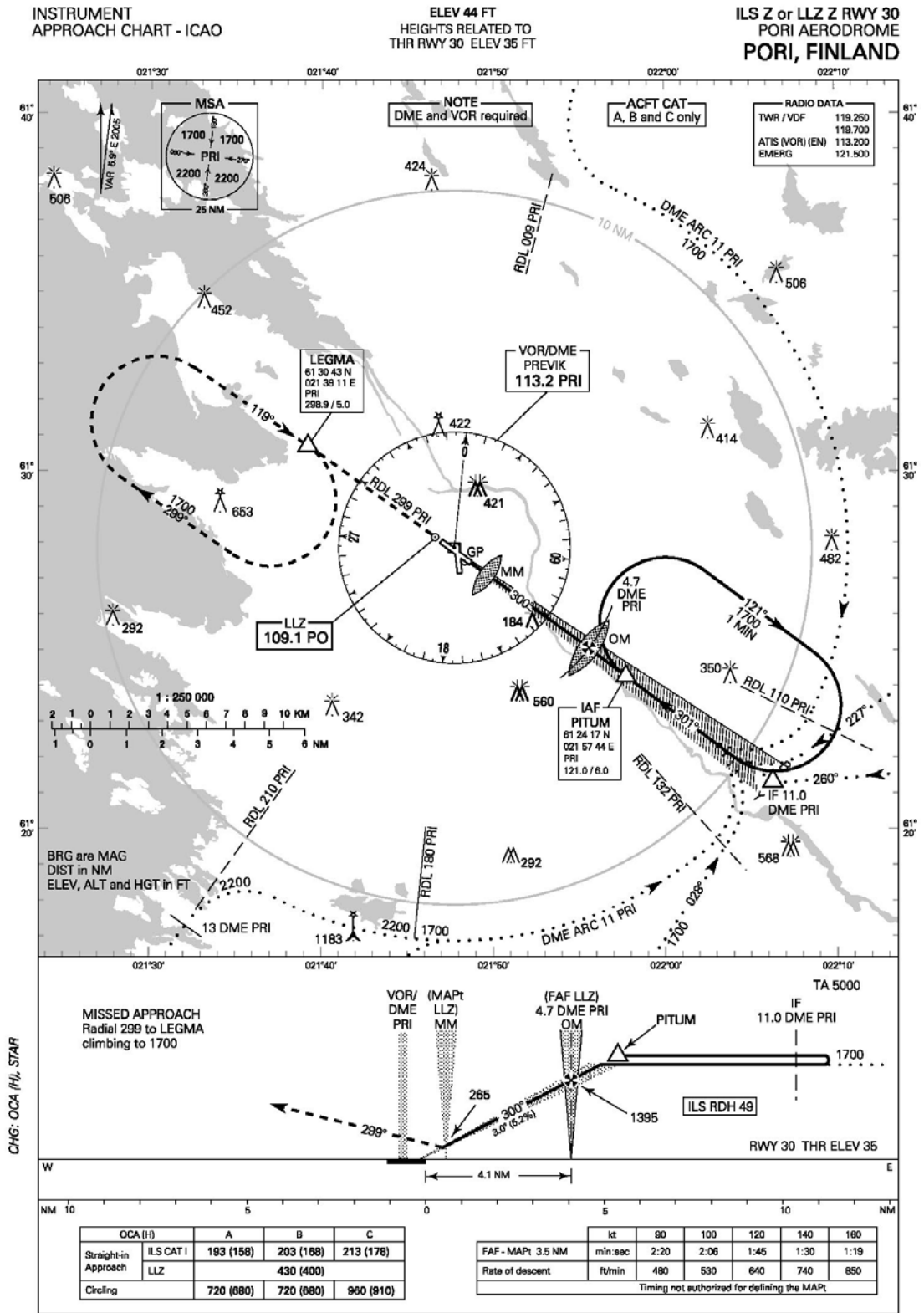


Figure 3. Position of the vehicle at the moment when PGT442 passed it, © Finavia, Permission 4/590/2007

At 20:24:19 PGT442 reported: “At the minimums, just at the minimums er ..we see approach lights, but..uh ..we commence..uh ..go-around”. At 20:24:25 PGT442 asked the TWR to confirm copying this information: “Did you copy 442”.

At 20:24:28 it was the air traffic controller’s turn to request PGT442 to confirm that they were flying a missed approach: “Sunturk 442, confirm you are going around. We still got the vehicle on runway for measuring the runway lights”.

PGT442 replied: “Affirm...uh...we are executing go-around but we just saw the approach lights aat the minimum so we`ll request to try again. Because...er...we are told...uh...minimum is not...er...enough but at the minimums we saw the approach lights.”



15 FEB 2007

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Figure 4. Instrument Approach Chart for runway 30, © Finavia, Permission 4/590/2007

The air traffic controller asked PGT442 to report PITUM outbound at 1700 ft. The aircraft acknowledged this and reported turning right towards PITUM. The established missed approach procedure for RWY 30 calls for a climb to 1700 ft to the fix LEGMA. The air traffic controller's request for PGT442 to report PITUM outbound deviated from the published missed approach procedure and, hence, it was deficient as an ATC clearance.

At 20:27:05 the air traffic controller informed PGT442 that the RVR for RWY 30 was 550 m. PGT442 reported PITUM outbound at 20:27:49 and was cleared to approach RWY 30, on which it landed at 20:33. PGT442 did not read back the approach clearance as per regulation. However, the air traffic controller ordered them to read it back more precisely.

2.2 Reporting of the incident

As the aircraft was about to depart Pori, the air traffic controller told the flight crew that he was going to report the occurrence as an incident. The pilots replied that they had flown according to standard procedure. Nevertheless, flying an approach without clearance and without sufficient RVR cannot be regarded as standard procedure.

The air traffic controller reported a serious incident, for the most part, as per regulation. However, he failed to report it to the ACC instantly. Instead, he waited until PGT442 had departed Pori. This resulted in some of the relevant material being lost and made it impossible to interview the pilots immediately after the occurrence.

The driver of the maintenance vehicle reported the incident on the Finavia's ground services deviation and occurrence report as well as on the Finnish CAA's Accident, Serious Incident and Occurrence Report.

The Finnish Civil Aviation Authority (CAA Finland) received the captain's account, dated 11 Nov 2007, on 3 Jan 2008 from Turkey's Civil Aviation Authority.



3 CONCLUSIONS

3.1 Findings

1. The air traffic controller and the pilots had valid licences and the required ratings.
2. The Runway Visual Range was below PGT442's landing minimum at the time of the occurrence.
3. Radiotelephony was unsatisfactory and conducted, to some extent, in violation to ICAO regulations.
4. Recordings show that the speech of the PGT442 pilots was, at times, unclear. Even an audio expert could not fully analyse the phrases used.
5. The air traffic controller thought that PGT442 referred to the minimum holding altitude on PITUM when they used the word "minimum". In contrast, the pilots meant the ILS approach decision altitude.
6. With regard to the valid ATC clearance, radiocommunications resulted in differing perceptions between the air traffic controller and the pilots.
7. Neither the recorded radiocommunications nor the captain's report unequivocally indicate what the flight crew intended to do after having reached the ILS approach decision altitude.
8. The pilots violated regulations when they continued with the approach while the Runway Visual Range was below minima.
9. The air traffic controller ordered the maintenance vehicle to vacate the runway. However, he did not order PGT442 to go around.
10. The driver of the maintenance vehicle swiftly followed the order to vacate the runway. However, he did not manage to completely clear the runway before PGT442 passed it.
11. The air traffic controller and the driver of the maintenance vehicle filed incident reports in accordance with the national regulation GEN M1-4. Turkey's Civil Aviation Authority relayed the captain's account to the Finnish Civil Aviation Authority.
12. The air traffic controller failed to report a serious incident instantly as specified in GEN M1-4. Instead, he reported the occurrence only after PGT442 had departed Pori.
13. Accident Investigation Board Finland was notified of the incident approximately 1.5 hours after the occurrence. Therefore, some relevant material was lost.
14. The investigation commission did not receive all of the material which it requested.
15. Pursuant to the Eurocontrol ESARR-2 classification, the severity of the occurrence was a Major Incident (B).



3.2 Probable cause

The incident was caused by PGT442 flying the approach without having received and acknowledged an approach clearance.

Contributing factors include the unsatisfactory and unclear radiocommunications between the air traffic controller and the flight crew as well as the fact that the pilots violated regulations by flying an approach when the reported RVR was below minima.



4 RECOMMENDATIONS

The investigation commission does not make any recommendations because present rules and regulations, if properly observed, suffice in preventing these kinds of incidents from taking place.

The investigation commission calls particular attention to the importance of following the rules and regulations of aviation radiocommunications from the perspective of flight safety.

The investigation commission also wants to underscore the significance of following the rules of reporting procedures from the perspective of accident and incident investigation.

Helsinki 24.7.2008

Markus Bergman

Erkki Kantola

Tii-Maria Siitonen

**PEGASUS AIRLINES' RESPONSE TO THE DRAFT FINAL REPORT 20.05.2008**

As Pegasus Airlines, in addition to the two contributing factors that are mentioned before, we believe there is a third contributing factor in this incident; "the tower not letting the pilot know that there is a RVR measurement vehicle on the runway".

If the tower has informed the pilot that there is a vehicle on the runway, this would have break the error chain at that moment and prevent the other errors. After learning that there is a vehicle on the runway, the pilot wouldnt proceed with the landing and would have taken the necessary pre-cautions immediately.

As Pegasus Airlines, we belive this item should be added to the incident as a third contributing factor since it will be helpful to inform the pilot that runway is not available for landing.

Sincerely yours.

Pegasus Havayolları olarak, daha önce belirtilen iki faktöre ilave olarak bu kazada üçüncü bir faktörün; RVR ölçen aracın pist içinde olduğunun pilota bildirilmemesi olarak değerlendirmekteyiz. Eğer kule RVR ölçüm aracını bildirseydi bu, hatalar zincirini kırabilirdi. Çünkü pilot pistte bir araç olduğunu öğrenseydi hemen gerekli önlemleri alacak ve inişe devam etmeyecekti.

Pegasus Havayolları olarak bu üçüncü maddenin diğer maddelere eklenmesi gerektiğine inanıyoruz. Çünkü pistin inişe müsait olmadığını bildirmek pilotun iniş planlamasında büyük bir fayda sağlayacaktı.

Saygılarımızla,

Kemal Helvacioğlu
Flight Safety Manager