Investigation report

C 2/2003 L

Translation of the original Finnish report

Incident between an airliner and airport maintenance vehicle at Kuusamo airport on 29 January 2003

F-GFUI, Boeing 737-300

Maintenance vehicle

SUMMARY

On Wednesday 29 January 2003 at 13.53 Finnish time, an air traffic incident occurred at Kuusamo airport, in which a charter airliner landed over a vehicle used for runway visual range (RVR) measurement at runway threshold. The Accident Investigation Board, Finland, decided to start an investigation of the incident on 31 January 2003. Ari Huhtala was appointed as investigator-in-charge, and Pekka Alaraudanjoki as a member of the investigation group. The French accident investigation authority nominated an accredited representative for the investigation.

After noon on the day of the incident, runway visual range (RVR) at Kuusamo airport decreased below 1500 meters, and the Flight Information Service Officer (FISO) asked an airport maintenance worker to measure RVR. By FISO's permission, airport maintenance vehicle Lento 30 was moved to the RVR measurement point, which was on the runway strip behind RWY 12 threshold. At the same time, a Boeing 737-300 airliner, call sign AXY852, operated by a French company named Axis Airways on a charter flight from Paris to Kuusamo, commenced an ILS approach to runway 12 without reporting its intentions and actions to FISO. Because of AXY852's position reports were deficient and sometimes missing, and there was some confusion related to radio communications, FISO did not have a clear picture of the flights' progression. AXY852 landed without receiving a "runway free" report from FISO. FISO had no time to request the airport maintenance vehicle to move away from the measurement point. The aircraft passed over the vehicle at runway 12 threshold with a vertical distance of 15-20 meters.

The investigation studied the actions of airport staff and flight crew at different stages of the incident. It was recognized that the flight crew did not comply with the instructions given in the Finnish Aeronautical Information Publication (AIP) on operations at AFIS aerodromes in Finland. Moreover, it was observed that FISO's actions were partly based on assumptions. She did not ask the pilots to repeat those radio transmissions which she did not catch or understand.

The incident occurred because AXY852 did not report entering the flight information zone or notify its intentions as required. It also failed to give all mandatory position reports during approach, and finally landed on the runway occupied by the maintenance vehicle. A contributing factor was that FISO did not fully understand the radio transmissions of AXY852, which were spoken in English with a French accent, but did not ask the pilot to repeat all messages that remained unclear to her. Moreover, the flight crew was not sufficiently aware of how air traffic services are provided at AFIS aerodromes in Finland.

To improve flight safety, the investigation commission recommends that instructions for air traffic services at AFIS aerodromes should be harmonised in all European Union member states.

The comments to the final draft have been taken into account in the final report.

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ABBREVIATIONS

ACC	Area Control Centre or Area Control
AFIS	Aerodrome Flight Information Service
AIP	Aeronautical Information Publication
ANNEX	Annex to the Convention on International Civil Aviation
AOC	Air Operator Certificate
ATIS	Automatic Terminal Information Service
ATS	Air Traffic Services
BKN	Broken (cloudiness 5-7/8)
BR	Mist
ºC	Degrees Celsius (Centigrade)
DA/H	Decision Altitude/Height
DME	Distance Measuring Equipment
EFKS	Kuusamo Airport
FISO	Flight Information Service Officer
FIZ	Flight Information Zone
FL	Flight Level
FEW	Few (cloudiness 1-2/8)
FZFG	Freezing fog
h	Hour
hPa	Hecto Pascal
ICAO	International Civil Aviation Organisation
ILS	Instrument Landing System
JAR	Joint Aviation Requirements
LFPG	Charles De Gaulle, Paris airport
m	Meter(s)
MHz	Megahertz
min	Minute(s)
NM	Nautical Mile
OVC	Overcast (cloudiness 8/8)
PF	Pilot Flying
PNF	Pilot Non-flying
QNH	Altimeter sub-scale setting to obtain elevation from the mean sea level
RVR	Runway Visual Range
SCT	Scattered (cloudiness 3-4/8)
UTC	Coordinated Universal Time
VHF	Very High Frequency (30-300 MHz)
VOR	VHF Omni-Directional Radio Range

1 FACTUAL INFORMATION

1.1 Sequence of events

This investigation report uses co-ordinated universal time (UTC), which at the time of the incident was two hours less than Finnish local time.

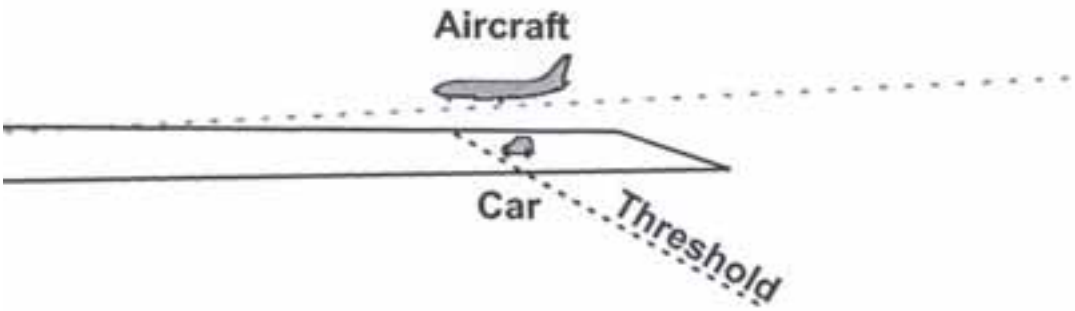
A Boeing 737-300 airliner operated by the French company Axis Airways on charter flight AXY852 departed Paris Charles De Gaulle (LFPG) airport on 29 January 2003 at 08.40 and landed at Kuusamo airport (EFKS) at 11.54. There were 123 passengers and five crew members on board. The pilot-in-command acted as pilot flying (PF) and the co-pilot as pilot non flying (PNF), who was in charge of e.g. radio communications during the flight.

AXY852 contacted Rovaniemi area control centre (ACC) at 11.20. At 11.31 ACC cleared the aircraft to Kuusamo (KLA) VOR/DME on flight level 100. While still under ACC's responsibility and on the ACC frequency, AXY852 asked about the weather in Kuusamo on Kuusamo AFIS frequency at 11.21 and again at 11.40. The Flight Information Service Officer (FISO) had some difficulty in understanding the radio transmissions of AXY852, and had to ask the pilot to repeat some of the messages.

Another charter flight from Paris, SLR4781, a Boeing 737-400 airliner, was flying ahead of AXY852 and landed at Kuusamo at 11.44. The weather at Kuusamo airport was foggy and there was great variation in visibility, so that runway visual range deteriorated considerably after each landing aircraft, due to surface inversion. After SLR4781 landed, RVR dropped from 1000 meters to 400 meters. SLR4781 called AXY852 and gave the following report in French: *"We are here at the AFIS. No problems. We saw the approach lights from 400 feet. Nothing wrong with the friction"*. AXY852 thanked for the information. FISO did not understand the discussion. At that time, AXY852 was leaving FL 100 and descending to Kuusamo AFIS zone.

SLR4781 taxied off the runway and reported runway vacated. FISO asked AXY852 to call Kuusamo radio beacon KS outbound, *"Call Kilo Sierra outbound",* to which AXY852 replied *"Report Kilo Sierra outbound"*. She also requested an estimate for passing KS *"And request estimate to Kilo Sierra".* At 11.50.17 AXY852 replied *"Estimating at 50"*, which FISO acknowledged. Immediately after this she requested, on the ground frequency, the airport maintenance vehicle Lento 30 to measure RVR. At 11.51.06 Lento 30 reported that seven lamps were visible. FISO then called AXY852, which replied *"Just passing Kilo Sierra".* At 11.51.23 FISO transmitted *"AXY852, call outer marker inbound"*, and AXY852 read back *"Report outer marker inbound".* At 11.51.31 FISO advised *"And latest runway visual range is 400 meters"*. At 11.51.40 AXY852 reported just having passed the outer marker and acknowledged the RVR of 400 m by saying *"Just past outer marker and runway visual range 400 meters"*.

Finnair 3395, which was standing on the apron, asked at 11.52.11 the FISO (in Finnish) to give AXY852's estimate KS inbound. FISO first replied on the ground frequency in Finnish *"56, 51 went outbound"* and after a while made the same report on the AFIS frequency. At 11.52.48 AXY852 reported *"Short final, AXY852"*. At first FISO replied on the ground frequency *"AXY852, say again, what did you say"*, but immediately after this he changed over to the AFIS frequency and said only *"AXY852"*. AXY852 landed while the RVR measurement vehicle was still in front of runway 12 threshold near the centerline, thus occupying the runway. FISO told having seen the landing aircraft, but not the measurement vehicle. The aircraft was flying at a height of about 15-20 meters over the threshold. After landing, PNF told PF that he had seen something on the right-hand side of the threshold, but was not sure what it was.



Picture 1. Landing aircraft over the threshold

After the incident, FISO made an internal report to the Air Navigation Services Department of CAA Finland (Occurrence and Observation Report, PHI) and also marked it as an incident report in accordance with Aviation Regulation GEN M1-4. Later when FISO met the flight crew at the airport, she asked them to file an incident report as well.

1.2 Personnel information

1.2.1 Pilots

The pilot-in-command held an airline transport pilot licence, valid until 28 February 2003, and a medical certificate valid until 15 July 2003.

The co-pilot held an airline transport pilot licence, valid until 30 December 2003, and a medical certificate valid until 30 April 2003.

1.2.2 Flight Information Service Officer

FISO's certificate of competence was valid until 9 September 2003, and she had a rating for working as a Flight Information Service Officer at Kuusamo airport. Her medical certificate was also valid until 9 September 2003.

1.3 Aircraft information

The aircraft (F-GFUI) is a French-registered Boeing 737-300 twin-engine jet airliner with 148 passenger seats. Its certificate of airworthiness is valid until 10 April 2005.

1.4 Meteorological information

According to an observation made at 11.20, weather at Kuusamo airport was as follows: wind calm, visibility 600 metres, runway 12 RVR 1000 metres, freezing fog (FZFG), scattered clouds (SCT) base 100 feet, overcast (OVC) ceiling at 300 feet, temperature –29 °C, dew point –32 °C, QNH 999 hectopascal (hPa).

Weather conditions at 11.50 were not reported.

According to an observation made at 12.20 the weather was: wind 180°, one knot, visibility 1500 metres, mist (BR), broken clouds (BKN) base 100 feet and overcast (OVC) ceiling at 300 feet, temperature –28 °C, dew point –32 °C, QNH 998 hPa.

There was a surface inversion at Kuusamo airport. The temperature at ground level was –29 °C, but already at 50 metres it was a few degrees warmer. As a result, when an aircraft landed the wake turbulence caused the slightly warmer and moister air above to blend with the cold air mass below, which condensed into fog. The fog lasted for 5-10 minutes after an aircraft landed and started to dissipate when the inversion was restored.

1.5 Communications

Radio communications between the aircraft and FISO were conducted on Kuusamo AFIS frequency 120.400 MHz. Ground traffic control operated on 445.45 MHz. The recordings of these frequencies, as well as telephone conversations, were examined during the investigation. All radio frequencies and telephone connections worked well and reception was good.

There were also a few phone calls made to the telephone in the AFIS, but they were not being recorded.

1.6 Aerodrome information

The location of Kuusamo airport is 65º59'25"N, 029º13'55"E and elevation 866 feet (264 m) from mean sea level. The type of air traffic service provided is Aerodrome Flight Information Service (AFIS). The runway in use is 12/30 and the main direction of approach 123º. The runway is asphalt-surfaced, 2500 m long and 45 m wide.

The airport information has been published in the Finnish Aeronautical Information Publication (AIP). Corresponding information is also contained in route manuals published by various commercial suppliers, such as the Jeppesen Sanderson Inc. airway manual used by AXY852 flight crew.

1.7 Flight recorders

Aircraft flight recorder data had not been read out for investigation.

1.8 Medical information

No medical examinations were made.

1.9 Detailed investigations

1.9.1 Aerodrome Flight Information Service, AFIS

Aerodrome Flight Information Service (AFIS) forms part of the air traffic services system. Applicable regulations are published in the Finnish Aeronautical Information Publication (AIP), section GEN 3.3. AFIS has been organised to safeguard IFR traffic on those aerodromes where air traffic control service is not considered necessary due to low traffic density. The service is given by an appropriately trained Flight Information Service Officer. At AFIS aerodromes and in surrounding airspace, aircraft are provided with traffic information as well as reports on weather, runway conditions and serviceability of aerodrome equipment. The purpose of this information is to ensure a safe and flexible flow of air traffic.

Based on the information given, the pilot-in-command makes his decisions and reports the procedures to be used for maintaining safe distance from other traffic. FISO gives new reports when necessary. As to the use of airport equipment and controlling vehicle traffic, the procedures are similar to those used on controlled aerodromes.

The AFIS unit's responsibility area comprises the Flight Information Zone (FIZ) established around the airport, and manoeuvring area. The boundaries of FIZ for each AFIS aerodrome are published in AIP Finland, section AD 2. Except for a few municipal aerodromes, all AFIS airports in Finland are operated by the CAA. These aerodromes are outside controlled airspace and the Flight Information Zones are in airspace class G. During operating hours of the AFIS unit, FIZ are in airspace class G+, and there is a FISO giving aerodrome traffic information service. The G+ airspace also differs from G airspace so that VFR flights are required to have two way radio communications in the G+ airspace.

1.9.2 Markings made by the FISO on IFR arrival strip

An IFR arrival strip is an instrument used by the FISO to monitor flights conducted under instrument flight rules. Flight plan data and any changes are marked on the strip before-

hand, and flight data is added during the flight. Moreover, the position of the strip on the desk shows the progression of the flight within FIZ and manoeuvring area.

For the incident flight, the IFR strip contained the call sign AXY852, aeroplane type B733 (Boeing 737-300), wake turbulence category M (medium) and speed N423 (423 knots). Estimated time of arrival at KS had been entered as 11.01, which had been calculated from flight plan data. The estimate had been later revised as 11.30, 11.34, 11.50, and the actual time KS outbound was marked as 11.50. The estimate for KS inbound was 11.56. En-route flight level had been entered as FL 370, and cleared flight level for descent at time 44 was FL 100. The strip also contained the markings for departure airport LFPG (Paris Charles De Gaulle), departure time 07.40, destination airport KS (Kuusamo) and flight time 03.21. The flight route marking indicated the last part of the route …. EDAXA UT311 VAS UT89 KLA. The time of initial contact had been marked as 51 (unclear marking) and landing time as 11.54.

Data on the runway used, QNH and transition level, approach procedure, time of commencing approach, and the marking on weather information reported were missing from the strip.

1.9.3 Measurement of runway visual range

When ground or runway visibility is less than 1500 meters, Runway Visual Range (RVR) is determined either by automatic measuring devices (transmissometer or scattermeter) or visually. Measured RVR must be reported with an accuracy of 25 meters when visibility is less than 400 meters, 50 meters when visibility is between 400-800 meters, and 100 meters when visibility is more than 800 meters. Odd values are rounded off downwards. RVR is reported up to 1500 meters. Higher values are announced as ”RVR more than 1500 meters”. On request, however, RVR can be reported up to 2000 meters. Where RVR cannot be reported up to 1500 meters due to other reasons than weather, the value that can be reliably determined is reported, e.g. RVR more than 1200 meters. Visually determined RVR is reported at 60-meter intervals from 50 meters to 1200 meters.

There is no automatic RVR measurement system at Kuusamo airport, and RVR for runway 12 is determined by visual observation. A specifically trained member of airport maintenance staff makes the measurement from a pre-determined point by FISO’s permission. The measurer reports how many runway lamps are visible when high-intensity lights are on. Based on this information, FISO calculates the current RVR.

The RVR measurement related to the incident was performed in accordance with ATS instruction MET 13, dated 15 June 2000. Kuusamo airport does not have an Aerodrome Manual required by Aviation Regulation AGA M3-3, which would determine e.g. the local standby and low visibility procedures. When there are flight operations on the airport and RVR decreases below 1500 meters, the local standby must be enforced, which requires e.g. raising the state of alert of fire and rescue services. However, FISO had not enforced the local standby at the airport as would have been appropriate in those conditions.

1.9.4 Automatic Terminal Information Service, ATIS

Automatic Terminal Information Service (ATIS) broadcasts information about weather and runway conditions at the airport. The information is updated either automatically or by a person trained for the task. The updated message is automatically repeated on a specific VHF frequency, and can be listened to from VHF radio receivers.

An ATIS system is not in use at Kuusamo airport. FISO's duties therefore include giving information on airport weather and other conditions, as well as any changes in them.

1.9.5 International instructions on AFIS

International Civil Aviation Organization (ICAO) gives instructions on AFIS operations in a technical publication, Circular 211 -AN/128, which is not binding to the member states. European Organization for the Safety of Air Navigation (EUROCONTROL) has not provided any instructions or regulations on AFIS operations to its members. For this reason, national instructions and regulations on AFIS may differ considerably from one state to another.

Finland has issued Aviation Regulation OPS M1-19 "Operations at AFIS aerodromes", which is mainly based on the ICAO publication mentioned above. For international distribution, instructions on AFIS operations in Finland have been published in the Finnish Aeronautical Information Publication (AIP). Moreover, route manuals published by various commercial companies contain instructions on AFIS based on the AIP. AFIS procedures for Flight Information Service Officers are given in an appendix to the Finnish Air Traffic Controllers' Manual (*Lennonjohtajan käsikirja,* LJKK).

1.10. Organisational and management information

1.10.1 Axys Airways

Axys Airways has an Air Operator Certificate (AOC) issued by the French aviation authority, valid until 31 March 2004. Company operations are based on an Operations Manual (OM) that complies with the European Joint Aviation Requirements for commercial air transportation (JAR-OPS 1). According to the Operations Manual, flight crew uses an airway manual published by Jeppesen Sanderson Inc.

1.10.2 Kuusamo airport

Kuusamo airport is owned by CAA Finland. It is operated as an independent profit unit which provides passenger services, ramp handling services, manoeuvring area services, air navigation services and other commercial services suitable for airport operations.

The airport did not have a current Aerodrome Manual as required by aviation regulations.

2 ANALYSIS

2.1 Actions by the pilots

The flight crew of AXY852 used Jeppesen Airway Manual for flight preparation. This manual, section ”Air Traffic Control”, page Finland-2, states that in Finland, ”AFIS service is available at those airports where the type and density of air traffic does not require a controlled airspace and ATC. The purpose of AFIS is to provide information necessary for the safe and efficient conduct of flight operations in the vicinity of an airport and in the maneuvering area. The pilot-in-command is responsible to maintain safe distance from other traffic as well as to report own intentions. It is also mentioned in Jeppesen Airway Manual that the procedures are similar to those applied at airports where ATC is provided.”

AIP Finland, section GEN 3.3 ”Air Traffic Services”, paragraph 3.2.6.2 states that an arriving aircraft shall inform the AFIS unit about e.g. its position, flying altitude and the estimated time of arrival to the aerodrome or above a navigation aid within the FIZ. This information must be given, at the latest, when arriving to the boundary of FIZ or over a reporting point given in the approach chart. In addition, the aircraft must report the runway selected, the approach procedure selected on an IFR flight, commencing the approach procedure and passing the initial and final approach fix (IAF and FAF) or outer marker during an instrument approach. Before landing a "runway free" report must be obtained from the AFIS unit.

The Finnish AIP gives much more detailed instructions for aircraft operations at AFIS aerodromes in Finland than the Jeppesen Airway Manual. Only the introduction to the relevant AIP section has been published in the Jeppesen manual. In the investigators’ opinion, the crew of AXY852 could not obtain sufficient information on operations at AFIS aerodromes in Finland from the Jeppesen manual alone.

During the inbound flight, AXY852 contacted Kuusamo AFIS two times while in Finnish airspace, asking about weather conditions at the airport before actually changing over to the AFIS frequency. FISO had difficulty in making out the radio transmissions of AXY852, because the pilot had a strong French accent. According to FISO, the same problem arose later when he was discussing with the flight crew at the airport.

In accordance with the arrival clearance issued by ACC, AXY852 entered the holding pattern at KLA VOR/DME on flight level 100 above Kuusamo Flight Information Zone (FIZ). At 11.44.07 AXY852 acknowledged ACC’s permission to leave FL 100 and to change over to Kuusamo AFIS frequency. At 11.44.38 another charter flight from Paris, just landed SLR4781, called AXY852 and reported the current weather and runway conditions at Kuusamo airport in French. AXY852 acknowledged this information. AXY852 still did not contact Kuusamo AFIS, nor did it report entering the FIZ or advise FISO of its other intentions within the FIZ as required.

Since AXY852 had not contacted Kuusamo AFIS, FISO called it on the AFIS frequency. AXY852 responded at 11.50.00, at which time it was, according to the investigators' estimate, already on ILS localizer for runway 12 at a distance of about 8 NM from touchdown. FISO could not have any knowledge of the position of AXY852, because initial contact was established so late during the approach.

AXY852's estimated route during final stages of approach

Flight SLR4781, which landed before AXY852, was operated with the same aircraft type as AXY852. Below is a list of flight times for SLR4781 during different stages of approach, which have been calculated from position reports given by the aircraft. The times are only indicative.

- KS outbound - 8 NM from touchdown 4 min 24 s
- 8 NM - KS inbound 2 min 4 s
- KS outbound - KS inbound 6 min 28 s
- KS inbound - landing 1 min 23 s
- 8 NM - landing 3 min 27 s

The above times were used as indicative values when determining the final approach stages of AXY852. AXY852 landed at 11.53.30, which indicates that it was three and a half minutes earlier on final 8 NM from touchdown runway 12. The time was then 11.50.00, at which stage the aircraft only made the first official contact with FISO, after the officer had called it. FISO requested the crew to report KS outbound and asked about the estimate to KS. AXY852 reported the estimate as 50, although it had already left KS outbound 3 minutes earlier. In addition, AXY852 reported passing KS (outbound) although it was on about 8 NM final. FISO planned her other operations, e.g. RVR measurement, based on this incorrect information.

The report on passing outer marker during final approach was correctly timed, but FISO could not understand it. The report was also inadequate, since it was not mentioned whether the aircraft was passing the outer marker inbound or outbound. A complete report might have alerted FISO to notice how the situation was developing.

AXY852 also reported short final when about one mile from threshold. FISO could not understand this report either, but her request to repeat it was transmitted on the ground frequency and only the acknowledgement came out on the main air traffic frequency. AXY852 landed without receiving a "runway free" report from FISO. The pilots told having thought that the aircraft had a permission to land, since the preceding flight, SLR4781, had reported "runway vacated" at 11.49.05.

As shown on Kuusamo approach chart, the minimum RVR for Class C aircraft on runway 12 is 600 meters. JAR-OPS 1.405 states that an approach shall not be continued beyond the outer marker, or equivalent position, if the reported RVR is less than the applicable minima. If the reported RVR/visibility falls below the applicable minimum after passing the outer marker or equivalent position, the approach may be continued to decision height (DA/H) or minimum descent altitude (MDA/H).

AXY852 had received the weather information for Kuusamo airport at 11.22, when RVR was 650 meters. At 11.40.24 AFIS reported to SLR4781 that RVR was 800 meters, which AXY852 heard while listening to Kuusamo AFIS frequency. At 11.44.54 SLR4871 transmitted to AXY852 *" No problems. We saw the approach lights from 400 feet".* At 11.50.40 AXY852 acknowledged the report of RVR 400 meters given by AFIS, and reported passing outer marker inbound at the same time. AXY852 was informed of the RVR degreasing below 600 meters just when passing outer marker inbound, at which time the decision on continuing the approach must be made. Therefore AXY852 could, in accordance with the regulations, continue the approach to decision height and further to landing, since the crew told having seen the approach lights from the height of 350 feet and having got the runway in sight a little later.

2.2 Actions by the Flight Information Service Officer

AIP Finland, section GEN 3.3 "Air Traffic Services", paragraph 3.2.3 "Duties and functions of AFIS unit" states that the duties of an AFIS unit include e.g. providing the aircraft operating within its area of responsibility with traffic information and other essential information, such as meteorological information, aerodrome conditions etc., and controlling vehicle traffic.

At the time of the incident, there was a strong surface inversion at the airport. When the wake turbulence of landing aircraft caused the cold and warm air mass to blend, a thick fog was formed and the visibility decreased considerably for 5-10 minutes. After SLR4781, which landed at 11.44, runway visual range dropped from 800 meters to 400 meters. For this reason, FISO needed to have the changed RVR values measured between the two aircraft, so that he could report them immediately to the following aircraft. To prepare for this, FISO requested the RVR measurer to be ready to move to the measurement point along the runway, by saying (in Finnish) *"And then maintenance, when this first one has come to a landing you should be ready to go and measure RVR quickly. It probably clogs up again".* Otherwise FISO saw that the conditions or traffic density were not unusual. However, she forgot to enforce the local standby after the weather deteriorated at the airport.

AXY852 requested weather information from Kuusamo AFIS for the first time at 11.21 and then again at 11.40, at which time the aircraft was still under Rovaniemi ACC's responsibility. FISO reported the weather conditions at Kuusamo to AXY852. However, the investigators see that this exchange about weather affected the later radio communications. The difficulties of comprehension that came up during the weather communications, which resulted in several (three times in a minute) requests to repeat a message, made FISO accept the reports given by the pilot during approach although she was not sure of their content. FISO tried to conclude what the reports received from the aircraft in each stage of approach could mean. Nevertheless, it is always important to ask for repetition of a message, even for several times, when there is any doubt about its content.

If the ATIS system had been in use at Kuusamo airport, AXY852 would have received all necessary weather information from the system. In this case, there probably would have been less radio communication which increased FISO's workload.

The Letter of Agreement between Rovaniemi ACC and Kuusamo airport specifies that, among other things, the time and position for changing over to the AFIS frequency must be agreed when an aircraft is released to the AFIS unit. The aircraft should contact the unit within three minutes of the agreed time. If contact is not established, FISO must call the aircraft.

At 11.43.28 ACC advised Kuusamo FISO that AXY852 would be given the permission to descend and change over to Kuusamo frequency. In this connection, ACC did not state the current position of the aircraft, nor was an exact time for initial contact agreed. Since AXY852 did not contact the AFIS unit, FISO was not aware of the position of the aircraft, and any exact time for initial contact had not been agreed with ACC, FISO did not call AXY852 until at 11.49.52. During the preceding six minutes, FISO issued taxi instructions to SLR4781. SLR4781 gave also some information on aerodrome weather to AXY852 in French. FISO also received two short phone calls during this time. Due to the illness of the airport office worker, his phone calls were forwarded to the AFIS auxiliary desk. This phone line was not being recorded. According to FISO there were several calls to the phone around noon. Nevertheless, none of these would have prevented FISO from calling the aircraft earlier.

Having established contact with AXY852, FISO requested the crew to report KS outbound and give an estimate for passing KS. The estimate given was 50. FISO marked the estimated time for passing KS as 50 on the strip. However, she failed to notice that the time was 50 already, and requested the RVR measurer to go to the measurement point at that time. FISO told that she normally asks the measurer to move away when the aircraft reports outer marker outbound. The RVR measurer gave the first measurement result 48 seconds after he was permitted to go to the measurement point. After receiving the new RVR values, FISO called the aircraft at 11.51.16 to give the latest weather information. To this AXY852 responded by stating *"Just passing KS"*. FISO understood this message to mean that the aircraft was flying KS outbound for approach, although it actually meant that AXY852 was flying KS inbound. The time was then 11.51.19, but FISO marked the actual time outbound on the strip as 50.

Based on the above mentioned message, FISO asked the aircraft next to report outer marker inbound, which the pilot acknowledged at 11.51.28. After this FISO informed that the runway visual range was 400 meters. AXY852 acknowledged this at 11.51.40 by stating *"Just past outer marker and runway visual range 400 meters"*. FISO did not understand the transmission, but acknowledged it by the aircraft call sign. The investigators believe that FISO assumed the pilot's readback to be about the weather information only, since she thought that the aircraft had flown KS outbound only a moment ago. This is also supported by the fact that, when the flight crew of an airliner waiting for start-up at the apron asked FISO at 11.52.11 about the estimate of the approaching aircraft for KS inbound, she replied (in Finnish) *"56, 51 went outbound".* At that time, the RVR measurer was still at the measurement point.

At 11.52.48 AXY852 reported being on short final, but FISO could not understand the message. Inadvertently, she first used the ground frequency to ask the pilot to repeat the message, by saying: *"AXY852, say again, what did you say?"*. After FISO noticed that she was transmitting on the wrong frequency, he changed over to the right frequency but did not ask for repetition of the message any more. Instead, she only acknowledged it by the aircraft call sign. Before AXY852's "short final" report, FISO had changed to the ground frequency to ask the RVR measurer to move away from the measurement point. Because of the unexpected report from AXY852, FISO did not immediately realize that she should change back to the main frequency. Soon after this report she saw the shape of the aeroplane passing over threshold runway 12, which was about 300 meters away. She did not see the vehicle on the threshold.

2.3 International instructions on AFIS

ICAO or EUROCONTROL have not issued any harmonised, binding regulations on how air traffic services at AFIS airports in member states should be organised. As a result, the states have developed their own national instructions and regulations, which may differ considerably from each other. For example, in some EUROCONTROL member states, IFR flights to AFIS airports are not permitted at all. On the other hand, IFR operations are very common at some of Scandinavian AFIS airports.

This lack of harmonised regulations is a cause of confusion in both domestic and international air traffic, and complicates the work of flight crews and ATS personnel. For this reason, the investigators see that instructions for air traffic services at AFIS airports should be provided in a similar way as e.g. air traffic control services are instructed in ICAO publication DOC 4444 "Air Traffic Management".

3 CONCLUSIONS

3.1 Findings

1. Both pilots had valid licences and appropriate ratings.

2. The Flight Information Service Officer (FISO) had a valid certificate of competence and appropriate rating.

3. Kuusamo airport does not have a current Aerodrome Manual as required by aviation regulations.

4. Kuusamo airport does not have an automatic RVR measurement system or Automatic Terminal Information Service (ATIS).

5. The traffic situation was quiet at the time of the incident.

6. Runway Visual Range decreased considerably when the wake turbulence of a landing aircraft caused the air mass near the ground to blend, and fog was formed.

7. Local standby was not enforced at the airport as required by applicable regulations.

8. The RVR measurement vehicle had a permission to be at the measurement point, where it also occupied the runway.

9. Rovaniemi ACC and Kuusamo FISO did not agree when AXY852 should change over to the Kuusamo frequency, nor did they confirm the position of the aircraft.

10. AXY852 did not report entering the Flight Information Zone (FIZ) or notify its intentions. It also failed to report its position during the approach, so that the FISO and any other traffic would have known where it actually was within the FIZ.

11. FISO asked AXY852 to report KS outbound. AXY852 replied reporting KS outbound, although it was already flying an ILS approach for runway 12 on about 8 NM final.

12. FISO did not ask the pilot to repeat all transmissions, which she could not understand or make out completely.

13. The reports given by AXY852 in English were somewhat inadequate and difficult to understand for the FISO, since the pilot had a strong French accent.

14. AXY852 landed on runway 12 without having received a "runway free" report from the FISO.

15. AXY852 landed over a vehicle at runway threshold, where the aircraft was flying at a height of 15-20 meters.

16. The PF did not see the airport maintenance vehicle behind RWY 12 threshold during the final approach or landing.

17. There are no harmonised and binding international regulations on how air traffic services at AFIS aerodromes should be organised.

18. This incidence did not lead into potential hazardous situation.

19. The Eurocontrol ESARR 2 Severity Classification of the incident was Major Incident (B).

3.2 Probable cause

The incident occurred because AXY852 did not report entering the Flight Information Zone and notify its intentions as required by applicable regulations. It also failed to give all mandatory position reports during approach, and finally landed on a runway occupied by a vehicle.

Contributing factors were that:

- the FISO had some difficulty in understanding the radio transmissions, which were spoken in English with a French accent,

- the FISO did not ask the pilot to repeat all radio transmissions from AXY852 which remained unclear to her,

- the flight crew did not have a sufficiently clear conception on how air traffic services are provided at AFIS aerodromes in Finland.

4 RECOMMENDATIONS

1. Only national instructions and regulations have been issued on the provision or air traffic services at AFIS aerodromes, and they vary considerably from one state to another. The current practice constantly causes both confusion and misunderstandings, thus complicating the work of flight crews and ATS personnel.

   It is therefore suggested that the instructions for the provision of air traffic services at AFIS aerodromes would be harmonised in European Union member states.

Helsinki 23.4.2004

Ari Huhtala

Pekka Alaraudanjoki

LIST OF SOURCES

The following material is stored at the Accident Investigation Board, Finland:

1. Decision number C 2/2003 L of the Accident Investigation Board Finland
2. Reports written about the occurrence
3. Interview transcriptions
4. Flight documents
5. ATC log and strips of Kuusamo AFIS
6. Transcriptions of the RTF and telephone recordings and the radar recordings
7. Weather information
8. The copies of the regulations, AIP, AIC and Finnish Civil Aviation Administration ATS regulations and instructions concerning Kuusamo airport
9. Requested and received statements for the final draft.

AXIS-AIRWAYS
Sécurité des vols. Mr Claraz didier
Centre Aviation Générale
Aéroport Marseille Provence
Hall 3 – B.P. 90
13728 MARIGNANE Cedex
FRANCE

January 21 th 2004

to

Onnettomuustutkintakeskus
Sörnaïsten rantalie 33 C
FIN-00580 Helsinki
FINLAND.

Dear Madame, Sir,

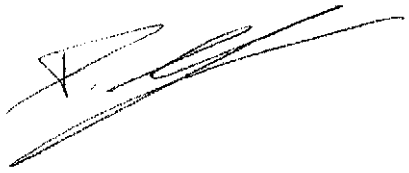
Following the draft concerning the investigation Report C2/2003 L, and after a last interview with our crew, I'am please to inform you that we are in agreement with it.

I thank you in advance to keep me advise about the final report as soon as it will be end.

Best regards,

You faithfully,

Flight Safety Officer, Mr CLARAZ Didier



Translation of the original Finnish document

I L M A I L U L A I T O S
CIVIL AVIATION ADMINISTRATION
LENTOTURVALLISUUSHALLINTO
FLIGHT SAFETY AUTHORITY

Päivämäärä Date: 30 January 2004
Dnro: 3/02/03

Accident Investigation Board, Finland
Sörnäisten rantatie 33 C
00580 Helsinki

Viite Ref: Your request for comments dated 27 November 2003

Asia Subject: COMMENTS OF THE FLIGHT SAFETY AUTHORITY ON THE FINAL DRAFT INVESTIGATION REPORT C2/2003 L

INCIDENT BETWEEN AN AIRLINER AND AIRPORT MAINTENANCE VEHICLE AT KUUSAMO AIRPORT ON 29 JANUARY 2003

The Flight Safety Authority will not make any statement on the contents of the investigation report.

We have no comments on the safety recommendations given.

Any necessary actions will be decided on separately.

Director, Flight Safety Authority (signature)
Kim Salonen

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ILMAILULAITOS
CIVIL AVIATION ADMINISTRATION
LENNONVARMISTUSOSASTO
AIR NAVIGATION SERVICES DEPARTMENT

Päivämäärä Date: 29.1.2004

Dnro: 1/510/2003

Onnettomuustutkintakeskus
Sörnäisten rantatie 33
00580 HELSINKI

Ref: Request for comment 27.11.2003

Subj: Investigation report draft C 2/2003 L, Air traffic Incident between a charter airliner and a maintenance vehicle at Kuusamo airport on 29.1.2003

The Accident Investigation Board, Finland, has sent a draft of the investigation report C 2/2003 L for comments to the Finnish Civil Aviation Administration.

CAA Finland has no remarks to the investigation report.

Director, ANS department

Heikki Jaakkola

For information: ILL-L, ILL-VQ, EFKS

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