



AIR ACCIDENTS INVESTIGATION
INSTITUTE OF CZECH REPUBLIC
Beranových 130
199 01 PRAHA 99

CZ-12-425

Copy No.: 5

FINAL REPORT

**Serious incident involving
A319 AFR1482 and B735 CSA77E
on 7th September 2012 at LKPR**

September 2013

This investigation has been carried out in accordance with the Regulation EU No 996/2010, Act No 49/1997 Coll., on civil aviation and Annex 13 to the ICAO Convention on International Civil Aviation. The sole objective of the investigation of an accident or incident under these Regulations shall be the prevention of accidents and incidents. It shall not be the purpose of such an investigation to apportion blame or liability. The Final Report, findings and conclusions therein concerning air accidents and incidents, and possibly systemic shortcomings endangering operational safety, are only of an informative nature and cannot be used otherwise than as a recommendation for the implementation of measures in order to prevent further air accidents and incidents with similar causes. The creator of the Final Report explicitly states that the Final Report cannot be used to determine blame or responsibility in connection with determining the causes of an air accident or incident and cannot be used for enforcing claims in the event of an insurance claim.

This report has been translated and published by the Air Accidents Investigation Institute to make its reading easier for English-speaking people. As accurate as the translation may be, the original text in Czech is the work of reference.

List of abbreviations

ACC	Area control centre
AAII	Air Accidents Investigation Institute
AD	Aerodrome
AIP	Aeronautical Information Publication
ALT	Altitude
ANS CZ	Air Navigation Services of the Czech Republic
APP	Approach control service
ATC	Air traffic control
ATCo	Air traffic controller
ATIS	Automatic terminal information service
ATS	Air traffic services
CTR	Control zone
FAF	Final approach fix
FL	Flight level
F/O	First officer (co-pilot)
FT	Feet, unit of length (0.3048 m)
IF	Intermediate fix
IAF	Initial approach fix
ILS	Instrument landing system
LKPR	Prague/Ruzyně airport
LLZ	Localizer
NM	Nautical mile, unit of length (1,852 metres)
NIL	None
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
RNAV	Area navigation
RWY	Runway
SI	Serious incident
SID	Standard instrument departure
STAR	Standard instrument arrival
STCA	Short-term conflict alert (automatic collision warning system for ATCos)
UTC	Coordinated universal time

A) Introduction

A319 aircraft

Operator: Air France
Aircraft type: Airbus, A319
Call sign: AFR1482

B735 aircraft

Operator: Czech Airlines
Aircraft type: Boeing, B735
Call sign: CSA77E

Location of incident: CTR LKPR
Date: 7/9/2012
Time: 07:45 – 07:54 UTC, (hereinafter all times in UTC)

B) Synopsis

On 7/9/2012, based on notification by the ATS, AAll commenced an investigation into the causes of the Serious incident of the close encounter of two aircraft during their approach to landing at LKPR on RWY24; A319 should have flown along STAR LOMKI 4S and B735 was directed to LLZ RWY24. Despite the immediate response of the ATCo, the minimum horizontal separation was reduced to a distance of 1.7 NM at the same ALT.

Subsequently, both aircraft landed without further problems.

The cause of the incident was investigated by an AAll commission comprising of:

Investigator in charge: Ing. Josef Procházka
Members: Ing. Ludmila Pavlíková
Ing. Petr Klikar, ANS CZ
Ing. Robert Pospíchal, ANS CZ

The final report was released by:

AIR ACCIDENTS INVESTIGATION INSTITUTE
Beranových 130
199 01 PRAHA 99

On 30 September 2013

C) The Final Report includes the following main parts:

1. Factual information
2. Analysis
3. Conclusions
4. Safety recommendation

1 Factual information

1.1 History of the incident

RWY 24 was in use at LKPR. The air traffic burden was at medium level.

The A319 aircrew were carrying out inbound flight procedures to LKPR, RWY 24 in accordance with the ACC instructions on a standard instrument route STAR LOMKI 4S. It is stated in the notes to STAR LOMKI 4S map: Unless otherwise instructed, after ERASU continue on heading 062°, radar vectoring will be provided.

After the change to APP frequency the crew enquired whether APP wanted to expedite in order to shorten the aircraft's track. Subsequently the crew received information "*Expect normal vectoring from four thousand.*" The crew acknowledged the said information.

After passage over IAF ERASU without further instructions, the crew commenced to turn into ILS RWY 24 in descent to ALT 4,000 ft.

At that time there was the B735 aircraft on the LLZ RWY 24 before FAF in ALT 4,000 ft with which the A319 came onto a collision course at the same ALT.

ATCo solved the incurred situation by instructing the A319 crew to left-hand turn into 060 degrees heading. This instruction came at the distance of 4.1 NM between the two aircrafts.

The A319 crew acknowledged the aforementioned instruction and notified the ATCo of "*we are following standard arrival*".

Having considered the slow response of the A319 crew, the ATCo repeated the instruction to left-hand turn. At this moment the distance between the two aircrafts was 3 NM. After acknowledging the said instruction the A319 crew received another instruction to climb up to FL 60. The A319 crew acknowledged this instruction.

In spite of the said measures, the minimal horizontal aircraft separation decreased to 1.7 NM.

1.2 Injuries to persons

NIL

1.3 Damage to aircraft

NIL

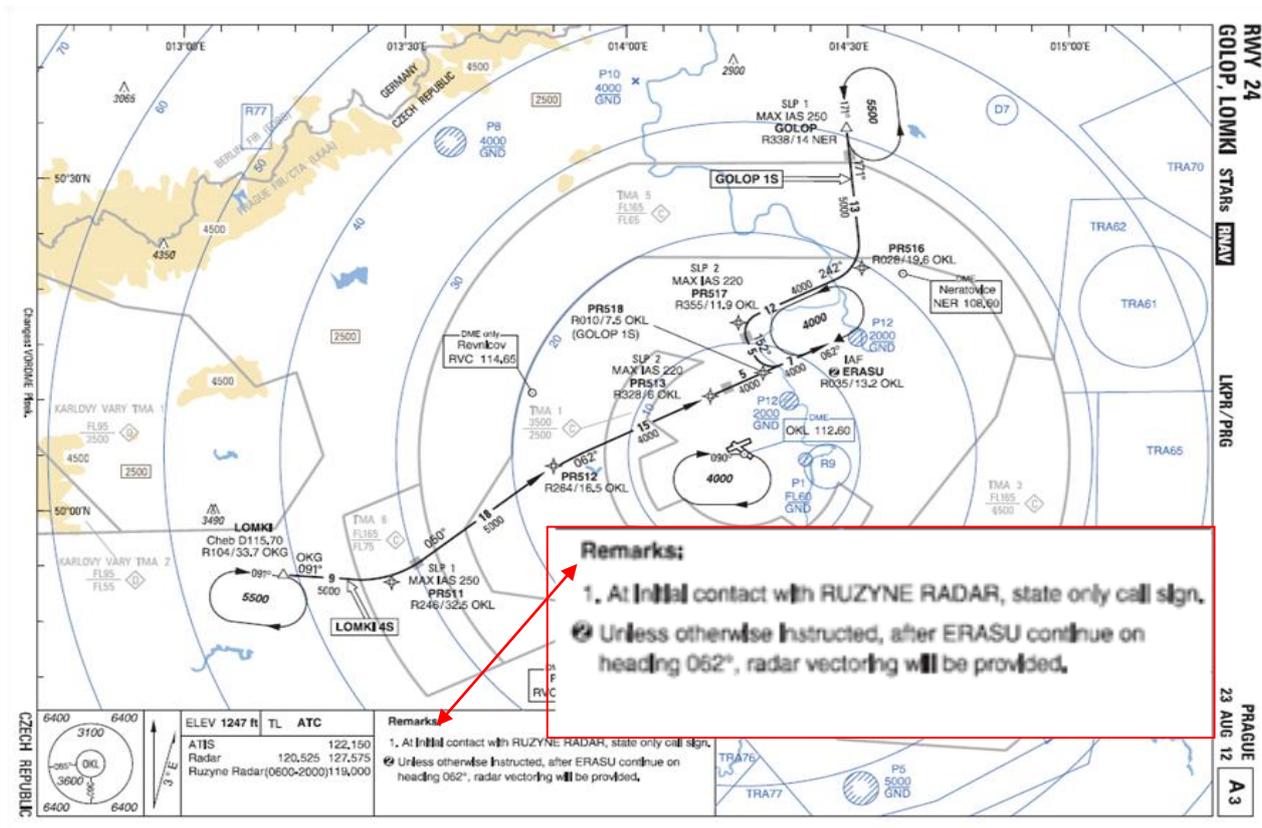
1.4 Other damage

NIL

1.5 Personnel information

1.5.1 A319 crew

For navigation preparation, the crew had a map for approaching the LKPR on RWY 24 GOLOP, LOMKI STARs RNAV, publisher not stated, which was in accordance with the AIP of the Czech Republic. A note on the map states the procedure for approach along STAR LOMKI 4S after passing IAF ERASU.



1.5.2 Statement of the A319 crew regarding the incident

During LOMKI 4S SID for witch we were cleared for reaching ERASU we followed PR531 to point PR532.

In my mind IAF was positioned at PR532 (IF). F/O advise me to ask for clarification.

ATC realised on this side situation and give radar for final 24. Separation with other aircraft > 3NM. No consequences but we interfered into final approach traffic.

1.5.3 B735 crew

NIL

1.5.4 Air traffic controller

Position	ATCo
Age	46
Sequential day in service	1
Time of service from the beginning of the shift (including breaks)	105 minutes
Time of service since the last break	105 minutes
Experience at the station (years)	21
Validity of qualification	Valid
Medical certificate	Valid

1.6 Aircraft information

1.6.1 Type A319

NIL

1.6.2 Type B735

NIL

1.7 Meteorological information

LKPR 070700Z 23011KT CAVOK 12/07 Q1024 NOSIG RMK REG QNH 1020

LKPR 070730Z 24011KT CAVOK 14/08 Q1024 NOSIG RMK REG QNH 1020

1.8 Aids to navigation

Radio navigation equipment corresponded to a 4E class airport with a runway for instrument landing system CAT IIIB in accordance with Regulation L-14 (ICAO ANNEX 14). They were functioning without faults and did not have an effect on the occurrence of the serious incident.

1.9 Communications

Communication was maintained between the air traffic control service and the aircraft on the frequency ACC 120,275 MHz and APP 127.575 MHz. Communication was without any faults did not have an effect on the rise of the serious incident.

1.10 Aerodrome information

LKPR is a category 4E public international airport. Its designation complies with the regulations of ICAO ANNEX 14.

RWY 24 was in use at the time of the serious incident.

1.11 Flight recorders and other records

The equipment of ANS CZ was utilized:

- Radio communication record (see Tab. 1)
- Radar record (5 sequences from this record)

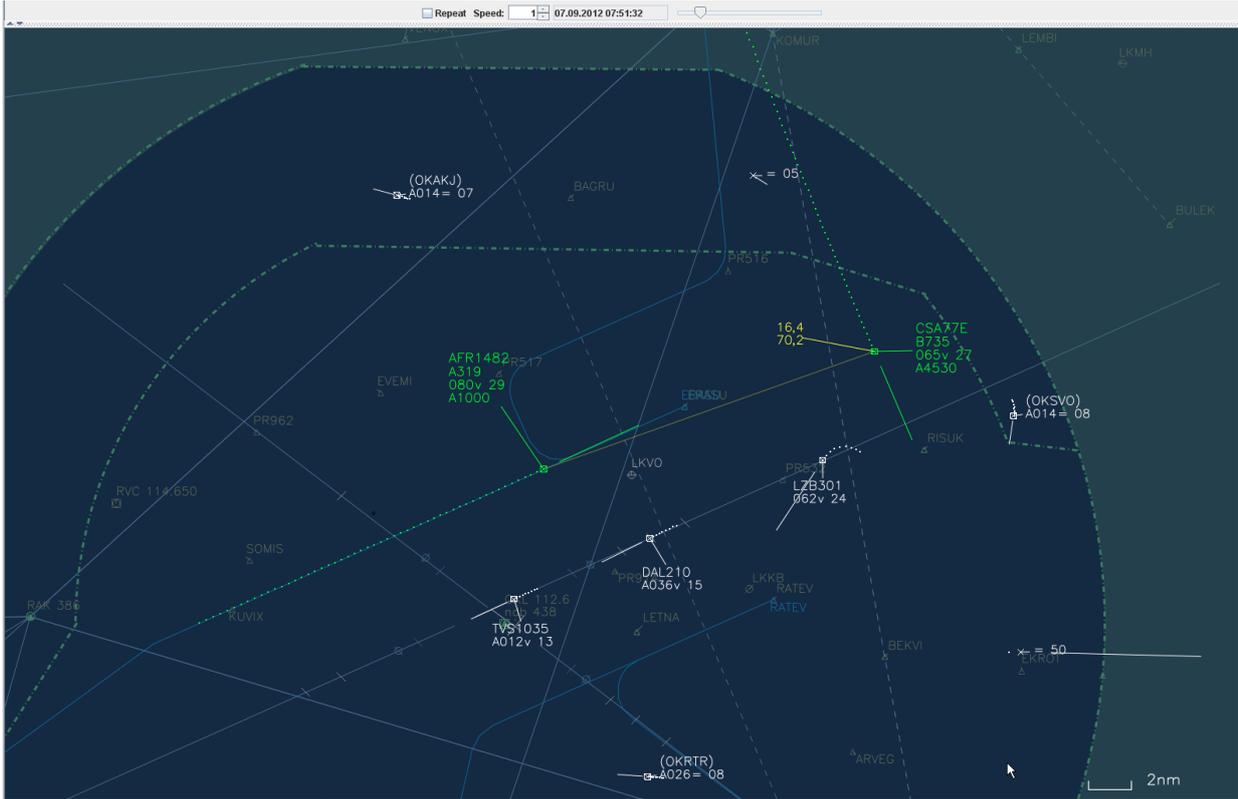
Tab. 1

Transcript radio communication between A319 and Ruzyně APP.						
No.	FREQ	FROM	TO	START TIME	MESSAGE	END TIME
1.	120,275	AFR	ACC	07:36:57	Praha control this is Air France one, four, eight, two, good morning, down to level two, five, zero on track to ODOMO.	
2.	120,275	ACC	AFR	07:37:02	Air France one, four, eight, two, Bonjour, Monsieur, radar contact, LOMKI, four SIERA arrival	
3.	120,275	AFR	ACC	07:37:19	Good morning, LOMKI four SIERA arrival, Air France one, four, eight, two.	
4.	120,275	ACC	AFR	07:38:54	Air France one, four, eight, two, descent flight level one, seven, zero, rate one thousand or more.	
5.	120,275	AFR	ACC	07:39:00	Down flight level one, seven, zero, with rate more than one thousand, Air France one, four, eight, two.	
6.	120,275	ACC	AFR	07:41:31	Air France one, four, eight, two, own rate of descent.	

7.	120,275	AFR	ACC	07:41:33	Own rate of descent, Air France one, four, eight, two.	
8.	120,275	ACC	AFR	07:42:42	Air France one, four, eight, two, Praha one, two, seven, decimal, five, seven, five. Air France one, four, eight, two (unreadable, something like greeting).	
9.	120,275	AFR	ACC	07:42:45	One, two, seven, decimal, five, seven, five,	
10.	127,575	AFR1482	APP	07:42:58	Praha Control this is Air France one, four, eight, two, good morning, flight level one, seven, zero, position LOMKI, information Mike.	
11.	127,575	APP			Break, break	07:43:07
12.	127,575	APP	AFR1482	07:43:20	Bonjour Air France one, four, eight, two, radar contact, descend flight level one, three, zero, no speed limit, November information.	
13.	127,575	AFR1482	APP		Information November, flight level one, three, zero, no speed restriction, for Air France one, four, eight, two.	07:43:34
14.	127,575	APP	AFR1482	07:44:20	Air France one, four, eight, two reduce two, five, zero knots or less.	
15.	127,575	AFR1482	APP		Two, five, zero knots or less, Air France one, four, eight, two.	07:44:29
16.	127,575	AFR1482	APP	07:45:55	Air France one, four, eight, two approaching flight level one, three, zero, for lower.	
17.	127,575	APP	AFR1482		Roger, maintain.	07:46:02
18.	127,575	APP	AFR1482	07:47:35	Air France one four, eight, two descend flight level one, zero, zero.	
19.	127,575	AFR1482	APP		Down to flight level one, zero, zero, Air France one, four, eight, two. Do you want us to expedite in order to shorten our track?	
20.	127,575	APP	AFR1482		Expect normal vectoring from four thousand.	
21.	127,575	AFR1482	APP		Copied Air France one, four, eight, two.	7:47:51
22.	127,575	APP	AFR1482	07:50:06	Air France one, four, eight, two descend altitude five thousand feet, QNH one zero, two, four.	
23.	127,575	AFR1482	APP		Down to altitude five thousand, QNH one, zero, two, four, Air France one, four, eight, two.	07:50:16
24.	127,575	APP	AFR1482	07:51:45	Air France one, four, eight, two descend altitude four thousand feet.	
25.	127,575	AFR1482	APP		Down to altitude four thousand, Air France one, four, eight, two.	7:51:53
26.	127,575	APP	AFR1482	07:52:36	Air France one, four, eight, two reduce two hundred knots or less.	
27.	127,575	AFR1482	APP		Two hundred knots or less Air France one, four, eight, two.	07:52:44

28.	127,575	APP	AFR1482	07:53:39	Air France one, four, eight, two any /unreadable/ for heading to the heading zero, six, zero? Turn left heading zero, six, zero, please.	
29.	127,575	AFR1482	APP		Left heading zero, six, zero. We are following standard arrival, Air France one, four, eight, two.	07:53:50
30.	127,575	APP	AFR1482	07:53:54	Air France one, four, eight, two turn left, please.	
31.	127,575	AFR1482	APP		Turning left zero, six, zero, Air France one, four, eight, two.	
32.	127,575	APP	AFR1482		And climb flight level six zero.	
33.	127,575	AFR1482	APP		Up to flight level six zero, Air France one, four, eight, two.	07:54:08
34.	127,575	APP	AFR1482	07:54:30	Air France one, four, eight, two now descend four thousand feet	
35.	127,575	AFR1482	APP		Down to altitude four thousand, Air France one, four, eight, two.	07:54:37
36.	127,575	APP	AFR1482	07:54:43	Air France one, four, eight, two turn right heading two, seven, zero.	
37.	127,575	AFR1482	APP		Right, right heading two, seven, zero, Air France one, four, eight, two.	07:54:51
38.	127,575	APP	AFR1482	07:55:04	Air France one, four, eight, two turn right heading two, seven, zero to intercept from the left side.	
39.	127,575	AFR1482	APP		Turn right heading two, seven, zero to intercept from the left side, Air France one, four, eight, two.	07:55:22
40.	127,575	APP	AFR1482	07:56:52	Air France one, four, eight, two established?	
41.	127,575	AFR1482	APP		We are established on localiser runway two four, Air France one four, eight, two.	
42.	127,575	APP	AFR1482		Cleared tower one, one, eight, one. Au revoir.	
43.	127,575	AFR1482	APP		Tower one, one, eight one, good bye, Air France one, four, eight, two.	07:57:03

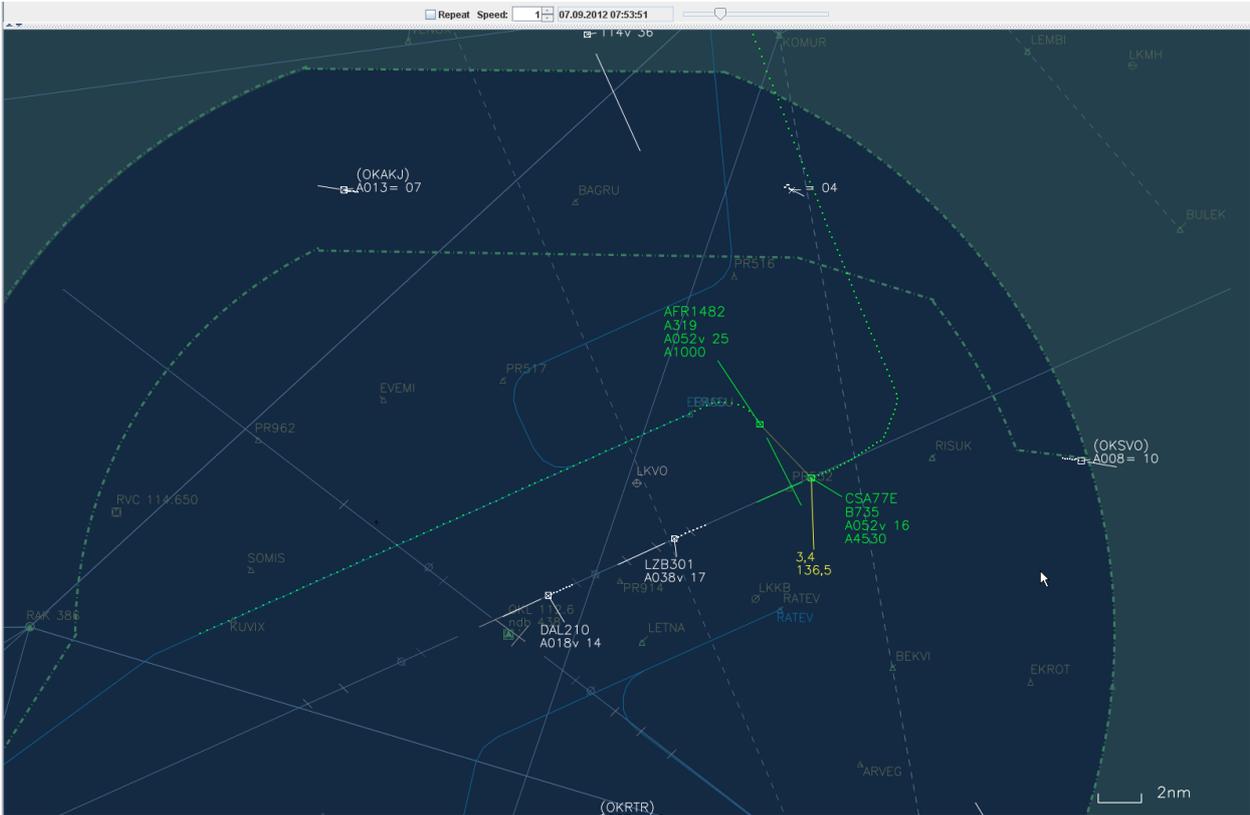
5 sequences from the radar record



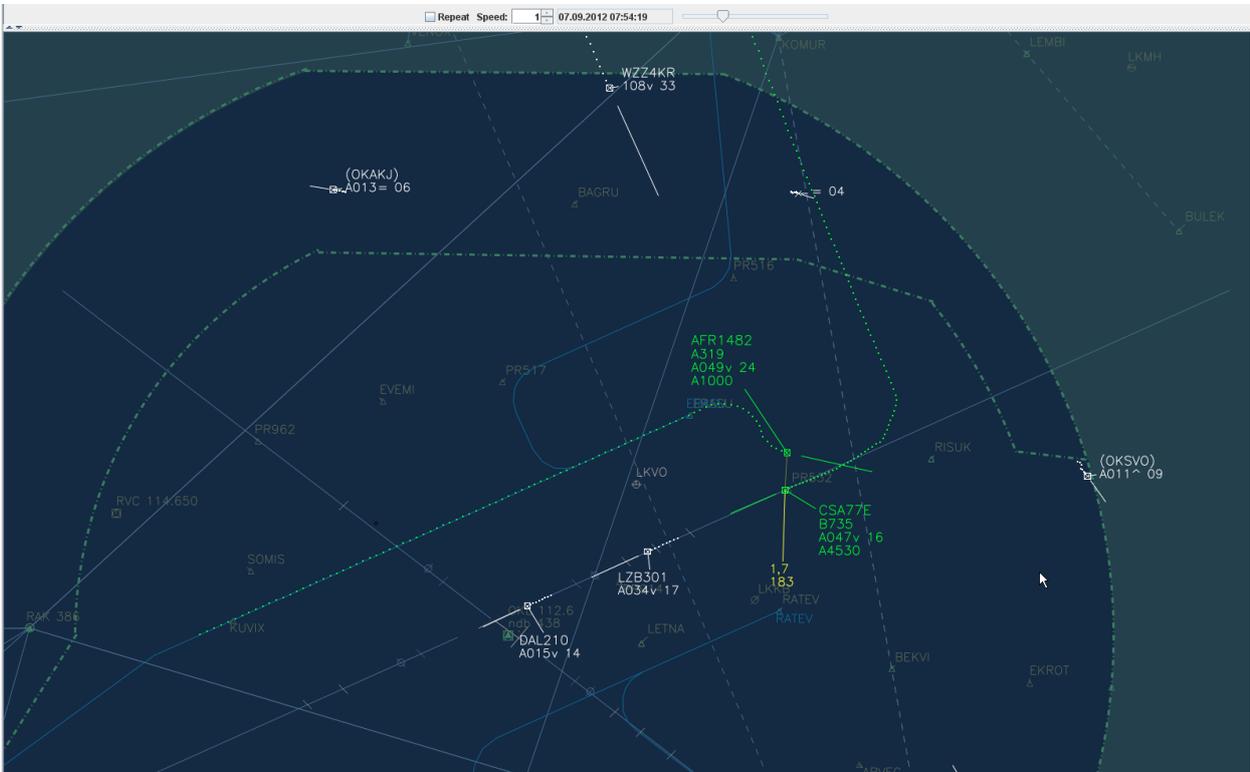
07/09/2012 07:51:32



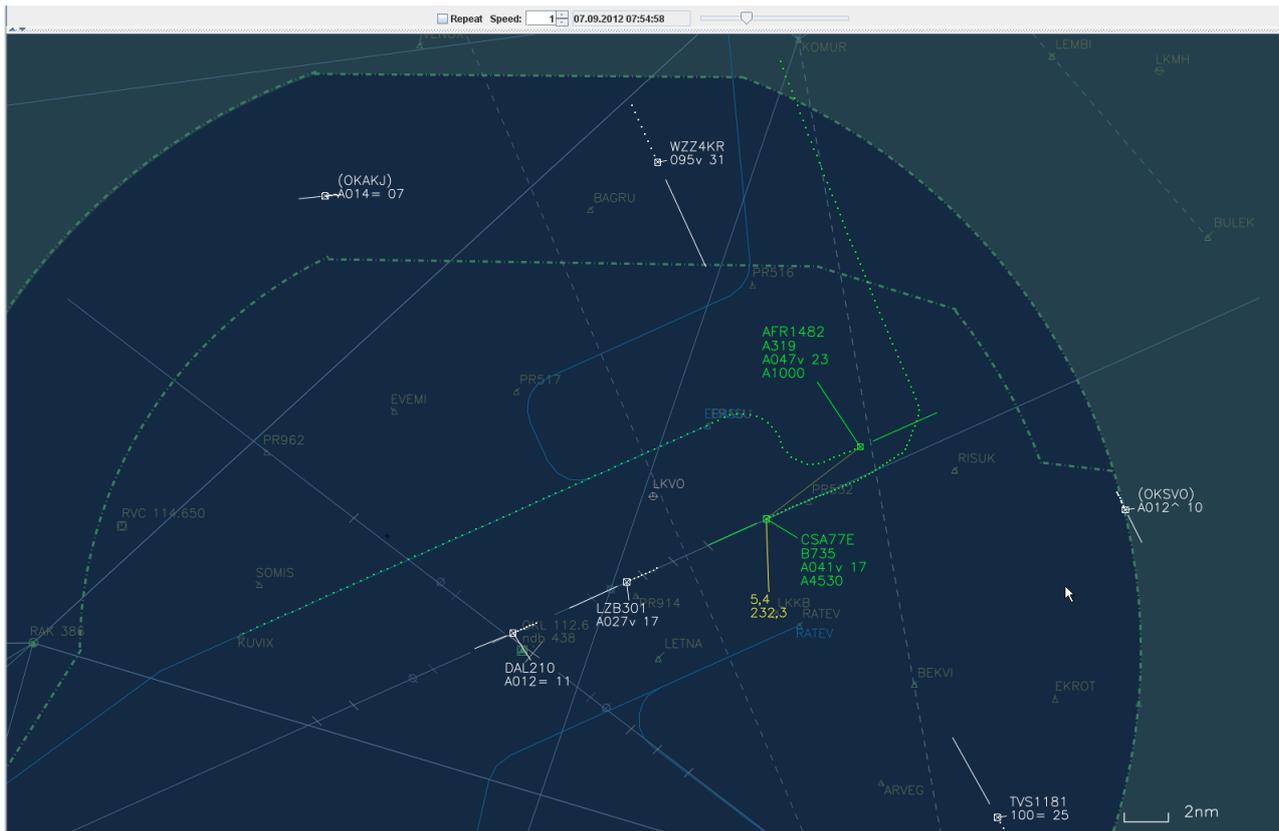
07/09/2012 07:52:56



07/09/2012 07:53:51



07/09/2012 07:54:19



07/09/2012 07:54:58

1.12 Description of the location of the serious incident

The serious incident occurred in the CTR LKPR

1.13 Medical and pathological information

NIL

1.14 Fire

NIL

1.15 Search and rescue

NIL

1.16 Tests and research

NIL

1.17 Organizational and management information

Air Navigation Services of the Czech Republic is a state enterprise.

ANS CZ is the provider of air traffic control services at the LKPR airport.

Certification to provide air traffic control services – valid.

The STCA system (SHORT- TERM CONFLICT ALERT) was in use.

(Note: Aircraft during air traffic control at TWR/APP stations often come into a distance from each other approaching minimum radar separation. Therefore, the parameters of the STCA (2.0 NM or 500 ft) are set so that an STCA is indicated the moment when a potential collision between aircraft arises. An STCA warning then enables an ATCo to prevent an aircraft collision.)

The assigned activating separation limit of 1.9 NM was broken.

1.18 Additional information

NIL

1.19 Investigation techniques used to find the cause

The investigation of the causes of the serious incident was carried out in accordance with Regulation L13 (ICAO ANNEX 13).

2 Analysis

The subject of the analysis was the activities of the A319 crew, operating procedures, radio communications, and the activities of the ATCo.

2.12 A319 flight crew

- The crew had the STARs RNAV map for RWY 24 at LKPR at their disposal; this map conforms to the procedures listed in AIP of the Czech Republic. In the notes to this map there is a procedure sequence for inbound flight STAR LOMKI 4S after passage over the IAF ERASU point stated. *Unless otherwise instructed, after ERASU continue on heading 062°, radar vectoring will be provided.*
- PIC did not accept the F/O's suggestion to specify more clearly the procedure after passage over the ERASU point by requesting ATS.
- After the passage over the ERASU the crew did not continue in 062 degrees heading in accordance with the instruction in the map for STAR LOMKI 4S, but commenced the final turn manoeuvre at RWY 24 without being instructed so by the ATCo.
- The first instruction to solve the collision situation, to left-hand turn in 060 degrees heading, was issued by the ATCo at 07:53:39 when the aircraft separation was 4.1 NM.
- The A319 crew acknowledged "*Left heading 060. We are following standard arrival.*"
- Regarding the slow response of the crew, the ATCo repeated the instruction to left-hand turn at v 07:53:54 when the aircraft separation was 3 NM. After acknowledging the said instruction by the crew, the ATCo issued the instruction to ascend to FL 60. The A319 crew acknowledged the said instruction.
- ATS were vectoring the A319 for landing on RWY 24 in the course of approach.
- The crew stated the horizontal distance between the two aircrafts greater than 3 NM. According to the radar record reading the given distance was 1.7 NM.
- There are two approach waypoints, PR511 and PR512, on arrival route LOMKI 4S. The waypoints, PR531 and PR532, mentioned by the crew in their statement are not published on the map of this arrival route.
- The waypoints PR531 and PR532 are published in the Instrument Approach Chart – ICAO PRAHA/Ruzyně ILS RWY 24(IAC). These waypoints are not on arrival route LOMKI 4S.
- The IAF was published in the position of the ERASU waypoint on STAR LOMKI 4S as well as on IAC. The waypoint PR532 is published in the Instrument Approach Chart – ICAO PRAHA/Ruzyně ILS RWY 24(IAC) as IF.
- The crew's wording in their statement "*in my opinion the IAF was positioned at PR532 (IF)*" was incorrect.
- In their statement the crew indicated the marking of the arrival route LOMKI 4S SID. The correct marking is LOMKI 4S STAR.

2.13 Air traffic controller

- He was fully qualified for the position of TEC.
- The situation at the Approach workplace was satisfactory and did not affect the performance of the services of TEC.

- He resolved the situation before the STCA warning system indicated an alert.
- He was subjected to a breath test for the presence of alcohol with negative results.

2.14 Weather

- It had no effect on the occurrence of the serious incident.

3 Conclusions

3.1 The commission came to the following conclusions.

- The A319 crew had navigation documentation at their disposal for approach at LKPR on RWY 24 STAR LOMKI 4S corresponding to procedures stated in the AIP of the Czech Republic.
- During the flight on STAR LOMKI 4S PIC did not accept the suggestion of the F/O to enquire for clarification further procedure after passing ERASU.
- In contradiction with the information about STAR LOMKI 4S in the aforementioned documentation, the A319 crew was after the passing IAF ERASU executing the turn to ILS RWY 24 without being instructed to do so by the ATCo, instead of proceeding in 062 degrees heading until further instructions.
- ATCo solved the incurred situation by issuing the instruction to the A319 crew to turn to the heading to 060 degrees.
- After the said instruction the crew reported to be following the standard arrival.
- ATCo issued repeated instruction to the A319 crew to left-hand turn and subsequent climb to FL 60.
- The A319 crew carried out the said manoeuvre.
- Despite the executed manoeuvre to avoid collision, the minimum horizontal separation was reduced to 1.7 NM.
- The A319 crew could have prevented the incident occurrence by enquiry at APP for clarification of the flight procedure after passing ERASU point.
- Pursuant to the Regulation L13, Attachment C, this incident has been qualified as a serious incident "Near collision requiring a collision avoidance manoeuvre to avoid a collision".

3.1 Causes

- Failure of the human factor. Failure to follow the procedure specified by the ATS by the A319 crew.

4. Safety recommendations

The AAI CZ has not issued any safety recommendations.